The Relationship between a Child's Affect Regulation and their Social Cognition (Theory of Mind and Empathy)

Heesoo Melanie Diara

DRXHEE001

A dissertation submitted in *partial fulfilment* of the requirements for the award of degree of Master of Arts (Neuropsychology)

ACSENT Laboratory

Department of Psychology

Faculty of Humanities

University of Cape Town

Supervisor: Prof. Susan Malcom-Smith

Word count:

Abstract: 206

Main Body: 14 660

PLAGIARISM

DECLARATION

1. I know that Plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

2. I have used the *American Psychological Association (APA)* convention for citation and referencing. Each significant contribution to, and quotation in, this essay / report / project from the work or works, of other people has been attributed, cited and referenced.

3. This essay / report / project is my own work.

4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

5. I acknowledge that copying someone else's assignment or essay, or part of it, is wrong, and declare that this is my own work.

SIGNATURE: ***H.Diara***

Acknowledgements

A special to thank you to my supervisor, Associate Professor Susan Malcolm-Smith, for her invaluable guidance and support throughout my Master's degree but especially during the challenging COVID-19 period.

I would also like to thank all the previous researchers and researcher assistants who collected the data that I have used in my study as well as all the parents and children who participated in the study.

Lastly, I would like to acknowledge the National Research Foundation (NRF) for their funding which allowed me to complete my thesis and MA degree.

Table of Contents

List of Tables

Abstract

Affect regulation is an essential component of human development and is crucial for successful social functioning and emotional health. Similarly social cognitive skills like empathy and Theory of Mind (ToM) are also necessary for successful social understanding and interaction in childhood. Researchers have reported associations between affect regulation and social cognition. For example, research shows that affect regulation is essential for empathic concern and behaviour. Additionally, studies in clinical populations have highlighted the relationship between affect regulation and ToM. Based on the literature, it was inferred that successful regulation of one's affect would result in greater empathic and ToM ability. Hence the study hypothesized that children's affect regulation would positively predict their empathy and ToM, over and above any effects of the covariates (age, IQ and working memory, gender, household income or highest level of maternal education (HLOE)). Data collected from one hundred and eighty five (N = 185) neuro-typical primary school children between the ages of 6 and 13, from three mainstream public primary schools in Cape Town was analysed. The results found no significant association between participant affect regulation scores and their empathy and ToM scores. Thus, it was concluded that affect regulation was not a significant predictor of social cognition in this sample.

Introduction

Human beings are inherently social, we form relationships with one another and develop a sense of social understanding that underpins these relationships (Wang, & Wang, 2015). Affect regulation, a core component of human development, is essential for the successful growth and preservation of relationships - forming bonds with peers is an important developmental task in childhood (Cole, 2014; Goldstein, 2010; Zeman et al., 2006). Childhood aggressive behaviour is related to difficulties in regulating affect, moreover an inability to regulate affect increases the risk of developing psychopathology (Aldao et al., 2010; Davidson et al., 2000; Gross, 2015; Schipper, & Petermann, 2013; Zeman et al., 2006). Furthermore, social cognitive skills, like empathy and Theory of Mind (ToM) represent distinct yet related psychological constructs that are essential for social understanding and the development of social relationships in both childhood and adulthood (Brown et al., 2017; Decety, 2010; Decety & Meyer, 2008; Preckel et al., 2018; Wang & Wang, 2015). They represent essential higher-order processing that grants us access to the mental states of others therefore fostering more successful inter-personal relations (Kanske, 2018).

Affect Regulation

Affect Regulation is a part of the broader construct of self-regulation. Self-regulation comprises various processes associated with the modulation of one's affect, behaviour, thoughts and attention in response to social or other contextual demands (Calkins, 2007; McClelland & Cameron, 2012). Self-regulation is a critical part of executive functioning and its first emergence is in infant temperament – individual differences in reactivity (emotional, attentional, motor) and self regulation processes (e.g.,effortful control) that regulate reactivity (Rothbart, 2007; Rothbart & Rueda, 2005). Affect Regulation concerns the management of the frequency, length and strength of emotions (Eisenberg et al., 2000; Koole, 2009; MacDonald, & Price, 2019; Rowland et al., 2013). Gross (2015) describes affect regulation as "our efforts to influence emotions in ways we think will increase the chance that they will be helpful rather than harmful" (p. 20). Meaning, we modify our emotions to either meet environmental demands or to achieve our goals (D'Agostino et al., 2017). Well-regulated individuals are able to flexibly modulate their emotions in a way that is socially appropriate (Eisenberg et al., 2004).

Furthermore, there are different affect regulation styles, which are considered to be either adaptive or maladaptive, with respect to psychosocial and emotional functioning

(Penney & Moretti, 2010). Adaptive affect regulation encompasses strategies that promote successful social functioning within one's environment (Bridges et al., 2004; Röll et al., 2012). They also allow for continued engagement in goal-directed behaviour, whereas maladaptive strategies impede successful affect regulation and goal-directed behaviour (Roberton et al., 2012). Adding to that, maladaptive affect regulatory strategies have been strongly associated with psychopathology in comparison to adaptive strategies (Aldao et al., 2010; Goulter et al., 2022; Gross, 2015; Röll et al., 2012; Schipper, & Petermann, 2013; Zeman et al., 2006). Adaptive regulation strategies include cognitive reappraisal while suppression and dysregulation represent maladaptive strategies (Roberton et al., 2012).

Cognitive reappraisal involves reframing or redefining emotional stimuli in order to change their emotional impact (Goldstein, 2010; Gross, 2015; Koole, 2009; Laghi et al., 2018; Lebowitz & Dovidio, 2015; Rowland et al., 2013). It comprises either reinterpreting the context of emotional stimuli or separating oneself from the emotional stimulus, by assuming a detached, third person perspective (Koole, 2009). Cognitive reappraisal has been described as being an 'antecedent focused strategy' as it is implemented before emotional responses are fully generated (Gross, 1998; Gross & John, 2003). It can thus alter or regulate the experience of an emotion and the emotional response (Gross & John, 2003). Reappraisers are open to sharing their emotions and have greater social well-being and report having closer interpersonal relationships (Cutuli, 2014; Gross & John, 2003).

On the contrary, suppression entails the active inhibition of the outward expression of emotion and is therefore also referred to as expressive suppression (Goldstein, 2010; Gross, 2015; Koole, 2009; Laghi et al., 2018; Lebowitz & Dovidio, 2015; Penney & Moretti, 2010; Rowland et al., 2013). Expressive suppression is a response-focused affect regulatory strategy, that is initiated later in the generation of emotion. It therefore alters the expression of emotions and the manner in which one behaviourally responds to emotional stimuli (Cutuli, 2014; Gross & John, 2003). With expressive suppression, both negative and positive emotions are inhibited and it is not able to diminish the experience of negative emotion, which then persists (Gross & John, 2003). Recurrent utilisation of expressive suppression is associated with diminished emotional well-being and chronic users of expressive suppression report feeling inauthentic in social relationships (Gross & John, 2003).

Dysregulation refers to an inadequate regulation of emotions and/or emotional responses in a given situation (Aldao et al., 2010). With affect dysregulation, regulatory

attempts are unsuccessful and emotions persist. Moreover, the expressed emotion is inappropriate to the context and emotions are changed too hastily or not soon enough (Röll et al., 2012). Affect dysregulation is also referred to as a "hallmark of psychopathology" (D'Agostino et al., 2017, p. 807) and has been related to aggressive behaviour in childhood (Schipper, & Petermann, 2013). In addition, affect dysregulation and expressive suppression are associated with aggression and externalising behaviours as well as depression and internalising behaviours respectively (Penney & Moretti, 2010; Roberton et al., 2012; Röll et al., 2012). Successful affect regulation is thus not only essential for social functioning but also for one's emotional well-being as individuals who are unsuccessful at flexibly regulating their emotions are at risk for developing psychopathology.

Social Cognition

Empathy. Empathy, like affect regulation, is essential for one's successful social functioning and emotional health. It is a central constituent of social cognition because it is essential for adapting and thriving in our social world (Decety, 2010; Decety & Svetlova, 2012; Reniers et al., 2011). Empathy is a multifaceted construct defined as the capacity to appropriately perceive, comprehend, and react to the emotions of others (Reniers et al., 2011; Wang, & Wang, 2015). In other words, empathy requires individuals to recognise and comprehend others' emotional experiences as well as vicariously 'feel' or share their emotional states (Kanske, 2018; Reniers et al., 2011; Singer, & Klimecki, 2014; Stietz et al., 2019). It encompasses an 'affective arousal' which resonates with the emotions the other person is experiencing (Decety, 2010; Preckel et al., 2018; Singer, 2009; Wang, & Wang, 2015). Most researchers regard empathy as encompassing a minimum of two components: cognitive and affective empathy (Bensalah et al., 2016; Brown et al., 2017; Dvash, & Shamay-Tsoory, 2014; Garaigordobil, 2009; Laghi et al., 2018; MacDonald, & Price, 2019; Reniers et al., 2011; Van der Graaff et al., 2014). Cognitive empathy involves the comprehension or awareness of others' emotional states; it can also be described as perspective taking which allows one to recognise the emotions felt by others (Decety, 2010; Laghi et al., 2018; MacDonald, & Price, 2019; Reniers et al., 2011). Affective empathy includes the experience or feeling of others' emotional states (MacDonald, & Price, 2019; Reniers et al., 2011). Put simply, cognitive empathy involves understanding emotion on a cognitive level, while affective empathy involves emotion understanding on a visceral level (Pileggi, 2017).

Empathy (both cognitive and affective components) requires the capacity to discriminate between oneself and others. Meaning, it includes an awareness that the origin of one's affective arousal is due to the affective state of the other individual (Decety & Lamm, 2006; Garaigordobil, 2009; Preckel et al., 2018; Reniers et al., 2011; Singer, & Klimecki, 2014; Stietz et al., 2019; Wang, & Wang, 2015). Breakdown of the distinction between the self and other leads to excessive empathic arousal and personal distress, which is a "self-focused reaction to the expression of another's negative emotion, often leading to avoidance behaviour" (Decety et al., 2012, p. 40). As a result, there is a shift of attention from the other person's feelings to one's own, which inevitably reduces empathic concern for the other person (Decety & Jackson, 2006).

Decety and colleagues (Decety, 2011; Decety & Jackson, 2004; Decety & Lamm, 2006; Decety & Meyer, 2008; Decety & Moriguchi, 2007; Decety & Svetlova, 2012) propose an empathy model that not only includes both the cognitive and affective components discussed above, but also, self-regulation of affect, which is what enables empathic concern or empathic behaviour. Simply understanding and feeling another person's emotion does not necessitate that one will act empathically toward them, hence, Decety and colleagues stress the importance of regulating empathy (Decety, 2011; Decety & Jackson, 2004; Decety & Lamm, 2006; Decety & Meyer, 2008; Decety & Moriguchi, 2007). The authors explain that empathic behaviour involves the interaction between cognitive empathy (emotion understanding & awareness) – which is facilitated by top-down brain processes and affective empathy (sharing emotion) – facilitated by bottom-up brain processes. They also emphasize that empathy depends on how these affective states are then regulated. In other words, how emotion understanding and sharing are regulated, will determine empathic behaviour. How this process works is that affect regulation (an important top down mediator of our affective states), down-regulates affect (emotion) which then allows us to circumvent empathic overarousal (which causes personal distress), thereby promoting empathic behaviour towards others (Pileggi, 2017). So, those successful at regulating their affective arousal are unlikely to feel overwhelmed or distressed and will therefore be able to act empathically toward the other person.

The empathy model proposed here by Decety and colleagues highlights the significance of incorporating affect regulation within the framework of understanding empathic behaviour. Other scholars also agree that our empathic ability (specifically

empathic response) is influenced by our ability to manage and regulate our emotions (Laghi et al., 2018; Ornaghi et al., 2020; Thompson et al., 2019). According to Goldstein (2010), a requirement of empathy is keeping one's emotions intact while experiencing someone else's affect. Meaning, successful regulation of one's emotions is associated with increased empathic concern for other people (Goldstein, 2010). The model presented by Decety and colleagues illustrates that affect regulation is essential for empathic behaviour, however, the relationship between affect regulation and empathy remains to be investigated.

Theory of Mind. Theory of Mind (ToM), another related and partially overlapping construct, is the ability to comprehend and ascribe mental states (intentions, beliefs, knowledge, desires, and emotions), to thyself & others (Brown et al., 2017; Decety & Svetlova, 2012; Dvash, & Shamay-Tsoory, 2014; Kanske, 2018; O'Neill et al., 2015; Preckel et al., 2018; Wang, & Wang, 2015). Moreover, it involves an understanding that people's behaviours are directed by their mental state**s** and also involves the ability to infer the mental states driving behaviour (Goldstein, 2010; Grazzani et al., 2018; O'Neill et al., 2015; Wellman, 2011). In other words, ToM encompasses detecting and decoding mental states and is an essential cognitive function which underlies social understanding (Goldstein, 2010). ToM allows one to both explain and predict the behaviour of others (Blair, 2005; Decety et al., 2012). Furthermore, ToM enables children to understand that people can have similar and different mental states (Decety & Svetlova, 2012; Singer, & Klimecki, 2014). Like empathy, ToM requires an awareness that the mental states of oneself may not be the same as others (distinction between oneself and others) (Preckel et al., 2018).

Some ToM researchers conceptualise ToM as comprising a cognitive and affective component (Dvash, & Shamay-Tsoory, 2014; Kalbe et al., 2007, 2010; Sebastian et al., 2012; Shamay-Tsoory, 2011). They define cognitive ToM as the understanding and attribution of beliefs, thoughts, and intentions to others while affective ToM involves the understanding of emotions and feelings (Dvash, & Shamay-Tsoory, 2014; Shamay-Tsoory, 2011). However, it is not essential to separate ToM into a cognitive and an affective component, as the understanding of both thoughts, beliefs, intentions, and emotions is an inherently cognitive exercise.

If one applies the cognitive and affective distinction of ToM with its relationship with empathy, then affective ToM would encompass cognitive empathy (Dvash, & Shamay-Tsoory, 2014). However, in reality, empathy incorporates the entire construct of ToM, I will

refer to an example to illustrate this: ‘Sally had a near drowning experience a few weeks ago, during swim practice she refuses to jump in the pool. You know Sally had a traumatic near drowning experience so you assume that she’s thinking about that incident and must be feeling scared or anxious. You then start to ‘feel’ the anxiety that she must be feeling (affective empathy) and you go over and give her a hug to comfort her.’ Through ToM you were able to understand that Sally must have been thinking about the near drowning incident, moreover, you were able to realise that perhaps Sally believes that she might drown again hence she does not want to jump in the pool. Here, you ascribed Sally’s beliefs and thoughts to yourself in an attempt to better understand her behaviour (perspective taking and prediction of behaviour). Adding to that, you were able to understand that she must be feeling scared or anxious based on your cognitive evaluation, which caused you to ‘feel’ her emotion and act empathically. The above example not only illustrates the importance of the entire construct of ToM in understanding empathy but it also highlights the similarity or overlap between ToM and cognitive empathy as they both involve the comprehension of emotional stimuli on a cognitive level. Moreover, a failure to comprehend the mental states of others, may lead to a failure in understanding their perspective (take their point of view). This would in-turn impair one’s empathic ability as empathy requires one to ‘experience’ another’s emotions. Seeing things from their perspective is necessary in order to recognise and share their emotional state (Brown et al., 2017; Reniers et al., 2011). Perspective taking can be considered an antecedent to empathy (Brown et al., 2017; Goldstein, 2010). A number of researchers hold the view that cognitive empathy is the same or similar to ToM and they do not make a distinction between cognitive and affective ToM (Bensalah et al., 2016; Blair, 2005; Brown et al., 2017; Decety, 2011; Decety & Moriguchi, 2007; Decety & Svetlova, 2012; Goldstein, 2010; Preckel et al., 2018; Vachon et al., 2014). ToM, like empathy, is an essential cognitive function which underlies social understanding. Together ToM and empathy are essential for most, if not all social interactions, and are especially crucial for complex real life social interactions (Goldstein, & Winner, 2012; Kanske, 2018).

Affect Regulation and Social Cognition

Individuals who are well regulated are capable of experiencing empathy as they can modulate their emotions and emotional reactions in order to experience affective concern for those in distress (Eisenberg, 2005). On the contrary, people with low affect regulation

become overwhelmed as they are not able to modulate their emotional arousal which leads to personal distress (Panfile & Laible, 2012). They then focus their attention on reducing their own distress instead of on assisting the individual in need (Panfile & Laible, 2012). A study with 3-year-old children revealed that their affect regulation was significantly associated with their empathic responses (Panfile & Laible, 2012). Additionally, children who had higher affect regulation not only had higher empathy but also displayed greater prosocial behaviour (Panfile & Laible, 2012). Similar results were observed in another study by Ornaghi et al. (2020) – children's affect regulation was positively associated with their empathic ability. Specifically, children who obtained high scores for positive affective regulation engaged in more empathic responses.

In terms of the association between affect regulation and ToM there is a scarcity of literature and empirical research investigating this association in the neurotypical population. However, there are studies with clinical populations that have examined the association between affect regulation and ToM in children (specifically adolescents). Researchers have investigated the nature of affect regulation and ToM dysfunction in children with Borderline Personality Disorder (BPD), Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD) (Dağdelen, 2021; Özbaran et al., 2018; Sharp et al., 2011). Sharp et al. (2011) explained that disturbances in inter-personal relationships along with affect instability and impulsivity are some of the core symptoms in BPD. They propose that dysfunction in mentalising (ToM) may underlie these disturbances. This is important as successful interpersonal relationships depend on the ability to regulate one's emotions while considering the intentions, beliefs and emotions of others (Ghiasi et al., 2016). In their study investigating affect regulation and ToM in adolescents with BPD traits or diagnosed BPD, Sharp et al. (2011), found that individuals with BPD traits and BPD tend to over interpret mental states and social signs – i.e., over mentalising. Moreover, they reported that the relationship between over mentalising and BPD traits was mediated by affect regulation difficulties. To elaborate further, over mentalising in adolescents with BPD may reflect their difficulty with regulating their emotional responses in social situations (Sharp et al., 2011). This occurs because they either misattribute improper mental and affective states to others or because they poorly contextualise or over interpret their own emotional reactions (Sharp et al., 2011). Furthermore, the authors proposed that the associations observed in their study may suggest that affect regulation difficulties may cause mentalisation (ToM) dysfunction.

Evidence from neurophysiological studies show that emotional arousal may disrupt mentalising in a range of contexts (Bartels & Zeki, 2000, 2004; Gobbini & Haxby, 2007; Gobbini et al., 2004; Ortigue et al., 2007). Additionally, the authors proposed a dynamic developmental explanation for the results observed. They proposed that early affect dysregulation may compromise one's ability to make use of social environments that most likely strengthen the development of mentalising (ToM), this in turn leads to dysfunctional mentalising. Over mentalising (which includes over interpretation of social cues) in-turn 'derails' the affect regulation system causing individuals with BPD to over interpret others' mental states and makes regulating anxious rumination (caused by this over interpretation) difficult (Sharp et al., 2011).

Although the information gathered from studies in clinical populations is beneficial, there remains a scarcity of studies investigating the correlation between affect regulation and social cognition (specifically ToM) in the neurotypical population. Hence, it is beneficial to investigate the relationship between these constructs in non-clinical samples as different clinical disorders have characteristics that may influence affect regulation and social cognition in nuanced ways. It would therefore be problematic or inaccurate to extrapolate the results from studies on clinical populations and apply them to non-clinical groups.

Covariates of Social Cognition

There are a number of variables that are associated with social cognition (empathy and ToM) in child development. These include: age, IQ and working memory, gender, maternal highest level of education (HLOE) and family income. Their relationship with social cognition will be discussed below.

Age and Empathy. During infancy, babies display mimicry, which is regarded as the start of empathy development (Brown et al., 2017; Goldstein, 2010). Moreover, empathic response or concern is also regarded as partly innate, this is illustrated when infants cry when they hear other infants cry (Christov-Moore et al., 2014; Decety, 2010; Singer, 2006; Stietz et al., 2019). Researchers explain that this represents emotional contagion, which is a precursor of empathy because babies are unaware that they are vicariously sharing each other's feelings as they have not yet developed the 'self-other' distinction (Singer, 2009; Singer, & Klimecki, 2014). Once babies gain gross motor skills, they tend to move closer to comfort those in distress (Goldstein, 2010). By the time children are between the ages of two to three years old, they are able to understand emotion as well as separate and differentiate their feelings

from others (Decety, 2010; Goldstein, 2010). In other words, they begin to develop self-awareness and recognise the difference between the self and others. (Singer, 2006). As mentioned earlier, the distinction between the self and the other – i.e., understanding that one's affective arousal is due to the emotions of the other, is essential in the development of empathy.

During middle childhood, empathy seems to increase with an increase in children's ability to take on roles. At this age empathy relies on children's capacity to self-regulate their emotions particularly when feeling overwhelmed by the emotional experience of others as this would inhibit their ability to feel empathy (Goldstein, 2010). Empathic response seems to decrease with age in adolescences however self-report measures suggest that empathy increases in adolescence (Goldstein, 2010).

Age and ToM. In infancy the first emerging signs of ToM are seen when babies follow and engage in joint attention and follow one's line of sight. (Goldstein, 2010). At the end of their first year of life, children start treating others and themselves as intentional agents (Brown et al., 2017; Wellman, 2011). Children as young as two years old, talk about emotions and feelings (Wellman, 2011), and at about three years of age they use cognitive terms relating to beliefs. Additionally, children at around three years old develop desire-behaviour reasoning and start to understand that desire guides behaviour (Goldstein, 2010). Between the ages of three and four years old, children are aware that mental entities like dreams and thoughts are 'internal and immaterial' (Wellman, 2011). Moreover, by four years old children begin to understand false beliefs, i.e., that people can hold erroneous beliefs about reality and beliefs that are different from their own (Grazzani et al., 2018; Singer, 2009; Wang, & Wang, 2015). Children's comprehension of false beliefs enables their ability to take others' perspectives and interpret the behaviour of others based upon their mental states (Wang, & Wang, 2015). The understanding of false belief is one of the most extensively investigated ToM milestones (Grazzani et al., 2018; Wang, & Wang, 2015) and is regarded as an indication that children have 'acquired' a ToM (Goldstein, 2010). By six years old, children become aware that people are able to hide their emotions and by the time children reach primary school, they understand that people can have beliefs about other people's beliefs (Grazzani et al., 2018).

By seven or eight years old, children seem to grasp the concept of 'interpretive ToM', in other words, they realise that two different people can have different interpretations or

explanations of the same situation, concept or reality (Goldstein, 2010). This 'interpretive ToM' ability is much more sophisticated than understanding false beliefs as children are required to understand that people can have various different reactions to identical stimuli (Goldstein, 2010). However, they still do not quite comprehend the complexities of interpretation (Goldstein, 2010). Adding to that, children seven years and older understand that people experience a constant flow of thoughts, ideas and information – one's mind is almost never devoid of mental information (Wellman, 2011).

ToM continues to develop through adolescence with adolescents developing the capability to create 'meta-representations', meaning they understand the milieu of their own representations and interpretations of reality (Goldstein, 2010). Moreover, they understand and acknowledge multiple perspectives on the same topic and are aware that the interpretation of events is shaped by our personal biases (Goldstein, 2010). As children develop into adulthood, ToM transforms into a multi-dimensional ability (Goldstein, 2010). Eisenberg (2005) found that perspective taking increases from adolescence into adulthood.

IQ, working memory and Empathy. Few studies have examined the relationship between empathy, IQ and working memory. However, Raine and Chen (2018) in their study where they developed a 30-item self-report questionnaire examining cognitive, affective, and somatic empathy (CASES), found that lower empathy was associated with lower IQ. To elaborate, participants (11 year old children) who had a lower empathy score on the CASES also had a lower IQ (assessed using the *Wechsler Intelligence Scale for Children–Fourth Edition*). Schwenck et al. (2014) investigated the influence of IQ on cognitive and emotional (affective) empathy in school-aged children and adolescents (aged 7 to 17 years old). Their results revealed that IQ significantly predicted cognitive but not emotional empathy.

In terms of working memory, a study investigating the association between empathy and executive functioning (attention, working memory and inhibition) in children (aged between 8 and 12 years old) with and without ADHD, Friesen (2019) found a significant positive relationship between empathy (total and cognitive empathy) and executive functions (including working memory) across all the participants. No significant correlation was observed between affective empathy and executive functioning.

IQ, working memory and ToM. In terms of IQ and ToM, Pequet & Warnell (2021), investigated the association between social cognition and social anxiety in school-aged

children (7 to 12 years old). The authors reported a positive relationship between participants' IQ and their performance on the Reading the Mind in the Eyes test (RMET) and Strange Stories task, which were two of the three ToM tasks included in the study. Moreover, other researchers have shown the positive relationship between fluid intelligence and performance on the RMET (Baker et al., 2014; Ibanez et al., 2013). Furthermore, research in clinical populations has further demonstrated the relationship between IQ and ToM (Baglio et al., 2016; Shojaeian et al., 2022). For example, children with Borderline Intellectual Functioning (BIF) – with an IQ between 70 and 85 points, displayed a significantly lower performance on all ToM tasks in comparison to neurotypical children (Baglio et al., 2016).

In terms of working memory and ToM, researchers have illustrated the importance of working memory in ToM development (Gordon & Olson, 1998; Hughes, 1998; Keenan et al., 1998). A systematic review, investigating the relationship between executive functions and ToM, reported a positive association between working memory and ToM in two studies included in their review (Pineda-Alhucema et al., 2018). Additionally, a longitudinal study examining the relationship between executive functions and ToM in middle childhood showed that early working memory predicts children's later ToM (Austin et al., 2014).

Gender and Empathy. Women are stereotypically portrayed as being more emotional, nurturing, and empathetic than men. Cultural and gender stereotypes as well as socialisation practices, perpetuate the notion that men are less empathic than women (Hoffman, 1977; Klein & Hodges, 2001). Women and girls are socialised to express emotion while men are taught to inhibit the overt expression of emotion, so even though men and boys feel emotion because they do not express it, they may appear less empathic than women and girls (Hoffman, 1977). A review by Christov-Moore et al. (2014) revealed that the difference in empathy across gender is less apparent for cognitive empathy than affective empathy. In other words, women and girls tend to score higher on affective empathy, while results for cognitive empathy tend to be inconsistent and are less often investigated (Christov-Moore et al., 2014).

Cohen and Strayer (1996) found that adolescent girls scored higher than boys on emotional responsiveness and self-report measures of empathy however, gender differences were not present on the cognitive scales of the empathy measures included in the study. The authors concluded that the affective aspects of empathy seem more implicated in gender differences than the cognitive aspects of empathy. Likewise, Sánchez-Pérez et al. (2014)

found that girls (aged 6 to 12) scored higher on self-reported affective empathy on the Basic Empathy Scale (BES), in comparison to age matched boys. No significant gender differences were found for cognitive empathy. Jolliffe and Farrington (2006) reported that adolescent girls (aged 15) achieved significantly higher scores on both the cognitive and affective empathy scales of the BES. However, the magnitude of the difference between the sexes was greater for the affective empathy scale.

Hoffman (1977) explained that even though women and girls are more inclined to have a vicarious affective response when encountering someone in an emotional situation, they are not more adept at assessing how the person feels. Both sexes are equally capable of assessing the other person's affective, cognitive, or spatial perspective (Hoffman, 1977). Despite this, researchers have reported that women and girls have a steady pattern of higher empathy than men and boys – this has been observed throughout childhood, adolescence, and adulthood (Christov-Moore et al., 2014; Garaigordobil, 2009; Hoffman, 1977; Macaskill et al., 2002).

Gender and ToM. There is inconsistent evidence regarding gender differences with ToM, however, the majority of studies in children report that girls score higher on ToM tasks in comparison to boys (Christov-Moore et al., 2014). For example, Charman et al. (2002) found that preschool girls slightly outperformed boys on the false belief task (ToM Task). Similarly, Walker (2005), reported that preschool aged girls obtained higher scores on the false belief task in comparison to aged matched boys. Moreover, Calero et al. (2013) observed that girls aged 6 to 8, performed significantly better on ToM tasks in comparison to boys (aged 6 to 8). Devine and Hughes (2013) also reported a significant gender difference – favouring girls (aged 8 to 13 years old) in ToM performance. Additionally, Ibanez et al. (2013) found that female adolescents out-perform their male counterparts on ToM tests. Despite this research showing a gender difference in ToM performance, other researchers have reported no such significant gender differences in children's ToM performance (Conte et al., 2018; Eggum et al., 2011; Hughes et al., 2011; LaBounty et al., 2008; Wellman & Lui, 2004; Wu & Su, 2014).

Maternal HLOE, Family Income and Empathy. In their study investigating the relationship between maternal educational level and children's empathy, Murad and Khan (2022), found that children (aged 11 to 16 years) whose mothers had no formal education, had the lowest empathy scores. In addition, Öksüz and Coşkun (2017) reported a significant

correlation between maternal level of education and children's emotional intelligence. The author's defined emotional intelligence as including self-awareness and management, social skills, motivation, and empathy. They found that children whose mothers had a university degree performed the best on an assessment of emotional intelligence.

In terms of family income and children's empathy, a study from Jakarta, Indonesia, which included 233 children aged 6 to 8, reported a significant positive association between children's empathy and household income (Amanda & Salim, 2019). Similarly, Sánchez-Pérez et al. (2014) reported a significant positive association between family socio-economic status (defined as family income), and children's empathy scores on both the parent and self-report version of the BES.

Maternal HLOE, Family Income and ToM. Maternal education has been positively correlated with children's ToM ability (Ketelaars et al., 2010; Meins et al., 2002). For example, Pears and Moses (2003) reported that maternal education was a strong predictor of preschool children's ToM. Maternal education moderately correlated with perception, desire and emotion understanding (Pears & Moses, 2003). Cutting and Dunn (1999) also reported similar findings that children's false belief and emotion understanding was highly correlated with maternal education.

Furthermore, Altum (2019) found that pre-schoolers' ToM scores were statistically differentiated with regard to maternal education and household income, however when maternal education and household income were entered into the multiple regression model (with the other study variables), they did not significantly predict children's ToM. In a meta-analysis examining the family correlates of false belief understanding in children aged 3 to 7 years old, Devine and Hughes (2018) reported a modest, statistically significant positive relationship between socio-economic status (SES) and children's false belief understanding. They explained that SES is a multifaceted construct which includes family/household income. In addition, they explained that studies that included multiple indicators of SES (parental level of education, household income, occupation etc.) as opposed to a single indicator of SES reported a stronger association with children's false belief understanding (Devine & Hughes, 2018).

Although the variables discussed above (age, IQ and working memory, gender, maternal HLOE and family income), are covariates of social cognition (empathy and ToM),

the focus of this research is on the relationship between affect regulation and social cognition (empathy and ToM) in children.

Rationale, Specific Aims, and Hypotheses

The literature reviewed above highlights the importance of understanding Affect Regulation and its interaction with Social Cognition. Decety and colleagues (Decety, 2011; Decety and Jackson, 2004; Decety and Lamm, 2006; Decety and Meyer, 2008; Decety and Moriguchi, 2007; Decety & Svetlova, 2012) have shown that affect regulation is essential for empathic behaviour. However, there is a shortage of empirical research directly examining the associations between affect regulation and empathy. In addition, studies in clinical populations have highlighted the relationship between affect regulation and ToM. However, these studies have investigated these constructs in clinical samples, meaning the results observed in these studies are invariably influenced by the characteristics of each disorder and cannot be generalised to the 'normal' population. This study aimed to address this gap by directly examining the nature of the relationship between affect regulation and social cognition. Moreover, this study used a non-clinical sample which allows for a more 'clear-cut' understanding of the constructs and how they relate to one another.

The aim of this study was to investigate the relationship between a child's Affect Regulation and Social Cognition (ToM & Empathy). Based on the literature reviewed, it was inferred that an increased ability to regulate one's affect would result in greater ToM and empathic ability.

This study therefore tested the following two hypotheses:

1. Affect regulation scores positively predict children's ToM scores over and above any effects of age, IQ and working memory, gender, highest level of maternal education (HLOE) or annual family income.
2. Affect regulation scores positively predict children's empathy scores over and above any effects of age, IQ and working memory, gender, maternal HLOE and annual family income.

Methods

Design and Setting

This study employed a cross sectional correlational research design to investigate the relationship between a child's Affect Regulation (the predictor variable) and their Social Cognition. Social Cognition was operationalised as comprising ToM and empathy (outcome variables). The COVID-19 pandemic prevented data collection in schools, as was originally intended, hence this study utilised data that had been previously collected for a larger study over the past few years. The data was collected at various primary schools in Cape Town, Western Cape, South Africa.

Participants

One hundred and eighty five (N = 185) neuro-typical primary school children between 6 and 13 years old from three mainstream public primary schools in Cape Town, Western Cape participated in this study. Recruitment targeted 3 English medium schools (Fairview in Grassy Park, Willows in Heideveld and Rondebosch East) of varying socioeconomic levels. Attempts were made to recruit equal numbers across schools, and across age and gender, but precise case matching was not possible, as there was a reliance on parents to volunteer to participate in the study. Sample demographic characteristics are presented in Table 1.

Inclusion and exclusion criteria. This study included both male and female primary school students. Children between 6 and 13 years old were included as this is the standard age range for primary schools in South Africa. Moreover, only children who received their schooling in English were included in the study, as the tests and/or assessments were administered in English. In addition, children with a history of head injury, diagnosed developmental disorders, neurological condition/s (e.g., epilepsy) or a diagnosed mental health disorder were excluded from the study. Moreover, participants who were on any psychiatric medication were also excluded from the study.

Sample Size. An a priori power analysis using *G*Power* software was run to calculate the required sample size for the study. The analysis was run for a Hierarchical Multiple Regression, power (1-β) was set at 0.8 with an alpha level of $\alpha = 0.05$. The ideal sample size for both small ($f2 = 0.02$) and medium ($f2 = 0.15$) effect sizes were computed. Seven predictors were added, the first was affect regulation (predictor variable), the others were covariates or control variables: age, intellectual functioning (full scale IQ and working memory), gender, SES (maternal highest level of education and annual family income). The

results of the analysis showed that a total sample size required for a small effect was 395 and 55 for a medium effect. This study had a sample size of $N = 185$ participants and was therefore able to detect medium effects.

Measures

This study used both task based child assessments as well as parent-report questionnaires. A few of the measures namely, the *Affect Regulation Checklist* (ARC, Moretti, 2003) and the *Questionnaire of Cognitive and Affective Empathy* (QCAE; Reniers et al., 2011), were originally self-report questionnaires, however, this study used a modified parent report version of these questionnaires.

General Measures. ***Basic demographic questionnaire.*** A basic demographic questionnaire was completed by participants' parents or legal guardian prior to testing. The questionnaire asked for information such as participant age, gender, home language, family structure, parental education, and family income. Additionally, the questionnaire included questions pertaining to the child's medication and health related issues which determined whether or not they met the exclusion criteria.

General intellectual functioning. *Wechsler Abbreviated Scale of Intelligence (WASI).* The *WASI* (Wechsler, 1999) which is internationally recognised as brief assessment of intelligence was used to obtain an IQ score for each participant. It comprises four subtests: Vocabulary and Similarities which combine to form a Verbal IQ (VIQ) score and Block Design and Matrix Reasoning subtests form a Performance IQ (PIQ) score. The individuals' Full Scale IQ (FSIQ) score is formed by combining the raw scores on each of the four subtests. The WASI has been used in various research and clinical settings in South Africa despite the lack of standardised South African norms for the assessment (Ferrett et al., 2010; Van Wyhe, 2012). In terms of reliability, the WASI has good reliability $\alpha = 0.93$ for VIQ, $\alpha = 0.94$ for PIQ and $\alpha = 0.96$ for FSIQ (Malcom-Smith et al., 2015).

Working Memory. The digit span backwards test was employed in order to test for working memory ability. It forms part of the *Digit Span subtest* of the *Wechsler Intelligence Scale for Children* (WISC-IV; Wechsler, 2004). Much like the WASI, the WISC-IV does not have normative data for the South African population, although they both have been used in South African research particularly at UCT (Gilli, 2016; Naylor, 2015; Pileggi, 2017).

Data on IQ and working memory were included in the study as they are potential confounding variables. They are consistently associated with ToM performance in child development; hence they need to be controlled for in the study.

Measures of outcome and predictor variables.

Affective Regulation Checklist. The *Affect Regulation Checklist* (ARC, Moretti, 2003) a 12 item, adapted parent-report questionnaire was used as a measure of children's affect regulation style (Appendix F). The ARC has been adapted from previously published affect regulation scales (Gross, & John, 1998, 2003; Shields, & Cicchetti, 1997). It was designed to tap into the multi-dimensional structure of affect regulation, and it encompasses three factors or components of affect regulation, namely, lack of affect control (dysregulation), affect suppression & adaptive reflection (Moretti, & Craig, 2013; Moretti, & Obsuth, 2009; Penney & Moretti, 2010). Two of the factors, affect dysregulation and affect suppression are regarded as maladaptive strategies of affect regulation, while reflection is considered to be adaptive (Moretti, & Craig, 2013; Penney & Moretti, 2010). There are 12 statements on the questionnaire to which parents and/or guardians select which of the 3 response options - 'not like my child', 'a little like my child', 'a lot like my child', most applies to their child. Item 11 is reversed scored (Penney & Moretti, 2010). The final score is reflective of the child's affect regulatory style ranging from maladaptive to adaptive.

The ARC has not been used in many studies in South Africa, however it showed good internal consistency in a study by Pileggi (2017) investigating the role of empathy in aggressive behaviour in South African youth.

Questionnaire of Cognitive and Affective Empathy. The *Questionnaire of Cognitive and Affective Empathy* (Appendix E), a 31-item, adapted parent-report questionnaire was used to measure both the cognitive and affective components of empathy (QCAE; Reniers et al., 2011). The items on the QCAE were adapted from various widely used empathy measures, namely, the Empathy Quotient (EQ) (Baron-Cohen et al., 2003), the Interpersonal Reactivity Index (IRI) (Davis, 1983), the Empathy subscale of the Impulsiveness Venturesomeness Empathy Inventory (Eysenck, & Eysenck, 1978) and the Hogan Empathy Scale (Hogan, 1969). The QCAE consists of 31 statements, either relating to cognitive or affective empathy. Parents and/or guardians select which of the four response options - "strongly disagree", "slightly disagree", "slightly agree" and "strongly agree", most applies to their child. Items 1, 2, 17 and 29 are reverse scored (Reniers et al., 2011). In terms of

reliability and validity, the QCAE (self-report version) is regarded as a reliable and valid measure of cognitive and affective empathy (Lockwood et al., 2014; Reniers et al., 2011). Moreover, in South Africa the parent report version of the QCAE has been found to have high internal consistency, yielding an overall Cronbach's $\alpha = 0.952$ (cognitive: $\alpha = 0.935$ and affective: $\alpha = 0.882$) (Louw, 2014).

UCT Theory of Mind Battery. *The UCT ToM Battery* was developed by Hoogenhout and Malcolm-Smith (2014) and was adapted from tasks from Baron-Cohen et al. (1999), Happé (1994), Steel et al. (2003), and Wellman and Woolley (1990). The UCT ToM Battery consists of 11 tasks which are divided into 4 modules of increasing difficulty: Early, Basic, Intermediate and Advanced (Hoogenhout & Malcolm-Smith, 2014). The Early module consists of the following tasks – Understanding Intention, Perception leads to Knowledge, Diverse Desires and Diverse Beliefs; while the Basic Module includes Unexpected Contents False Belief, Location Change False Belief and Explanation of Action. The Intermediate module includes Strange Stories (Happé, 1994) and Second Order False Belief while the Advanced module includes Faux Pas (Baron-Cohen et al., 1999) and Lies and Jokes.

The assessment began at the age appropriate level and credit for all tasks prior to the starting module was given to participants upon passing their starting module. Participants proceeded until they either failed a module or completed the entire battery. Each task did not only include test questions pertaining to ToM, but also control questions to ensure that participants' understanding was not influencing test question results. ToM scores for each task were added up and this total score was used as a measure of their ToM ability. The *UCT ToM Battery* has been used successfully within a South African population (Hoogenhout & Malcolm-Smith, 2014; Ringshaw et al., 2021).

Procedure

Following ethics approval from the UCT Psychology Department Ethics Board (Appendix A) and the Western Cape Education Department (Appendix B), recruitment information was sent to the principals of the various schools informing them about the study. Once permission was granted by the school principals, students and parents were recruited to participate in the study. Information was sent home with the students to give to parents and those who were interested in partaking in the study provided their informed written consent for participation. Parents then sent back the completed consent forms (Appendix C) to school with their children. Once the consent forms were received by the principal researcher, eligible

participants were contacted and given information about the time and day of assessment. The relevant parent questionnaires were completed by parents and handed back to the researcher. Several evening group sessions were set up at the schools, where researchers introduced themselves and the project. During these sessions parents could fill out the questionnaires, and ask researchers any questions they might have – this was on a voluntary basis, and most parents at Willows and Fairview primary attended. The principal researchers then liaised with the school principal and teachers to decide suitable times to conduct assessments with the children. Children's assent was obtained on the day of assessment (Appendix D). Thereafter the relevant child assessment measures were administered in a quiet space on the school premises. The assessment required two sessions, conducted on different days, in order to avoid fatigue of participants. The children received stickers and snack packs after each assessment session. Parents were compensated with R100 for their time and once data collection was complete participants were then thanked for their participation and adequately debriefed.

Data Management and Statistical Analyses

All the data that was collected over the past few years was added to an Excel Spreadsheet which can only be accessed by the relevant researchers. This study analysed the data pertaining to Affect Regulation and Social Cognition (ToM and Empathy). Version 28 of *Statistical Package for the Social Sciences* (SPSS) (IBM Corporation, 2021) was the statistical software that was used to analyse the data, α was set at = .05 (Field, 2009). Before data analysis could be conducted, the issue of missing data had to be resolved. Data was captured for a total of 185 participants. Nine of these cases contained some missing data. Eight were missing responses to some 'Advanced' questions, while the remaining case was missing responses to 'Intermediate' questions. The number of missing responses in each case ranged from 2 to 5. Given the sparsity of the missing values in each case, it was decided that imputation would be an appropriate response.

Imputation procedures were conducted in R Studio (Version 1.3, 2020), using the package 'mice' by Stef van Buuren (2021). This package enables the use of a predictive mean matching imputation methodology, which is considered a far more robust imputation procedure than traditional methods. Imputation was successful for all but one item (2nd Order FB ToM), which the mice package failed to model due to issues in collinearity. Attempts were made to model this item on a restricted set of predictor items but were unsuccessful.

Given that only one response was missing from this case, it was decided that mean imputation would be justified.

Descriptive analyses. A complete set of descriptive statistics were generated which allowed me to investigate the data distribution and relevant sample characteristics. All the assumptions relating to planned analyses were checked and upheld hence no adjustments needed to be made.

Inferential analyses. A hierarchical Multiple Regression Analysis (MRA) was employed for the main analyses. This study had one main predictor variable – Affect Regulation measured by the *ARC*, the calculated raw scores were used. There were six covariates: participant age, intellectual functioning (IQ and working memory); gender and SES (maternal highest level of education and annual family income). The outcome variables were social cognition as measured by ToM (*UCT ToM Battery*) and empathy (*QCAE*). Participant raw scores were calculated for the *UCT ToM Battery*, these scores were then converted into a raw score percentage and then standardized (z scores) in order to make participant ToM scores comparable across age. The *QCAE* raw scores were used. Two hierarchical Multiple Regression analyses were run, one for ToM and one for empathy (i.e., two models). In terms of the order in which the variables were entered into the models, age (months) was entered first followed by IQ and working memory, which were entered together as they both represented intellectual functioning. Next, gender was entered as a categorical binary variable with males coded as 1 and females coded as 2. Annual family income and maternal education were then entered together as they both represent socioeconomic status (SES). They were both entered as categorical variables; annual family income had 4 levels (0-75 000; 75 001-275 000; 275 001-475 000; 475 001-675 000) and maternal HLOE had 3 levels (primary, high school and tertiary education). Lastly, affect regulation was entered as it was expected that affect regulation would predict social cognition over and above the other variables (Field, 2009).

Results

Sample Characteristics

Participant sample characteristics are presented in Table 1 below. Two-tailed independent sample t-tests were conducted which revealed no significant differences in the continuous variables – age and participant HLOE, across gender. Additionally, a chi-squared (x^2) test of association to assess the distribution of home language across gender was attempted but could not be conducted as 40% of the categories had expected values of less than 5. The majority of participants spoke English as their home language. As a result, a Fisher's exact test was thus employed to determine if there was an association between gender and home language. The results indicated that there was no statistically significant association between them.

Table 1
Demographic Sample Characteristics (*N* = 185)

Characteristic	Group		Significance Across Gender		
	Male (*n* = 80)	Female (*n* = 105)	*t*	*p*	*d*
Age (Month)					
M (*SD*)	120.96	124.56 (25.72)	-0.93	0.36	0.14
Range	72 – 167	72 – 167			
Participant HLOE (No.			-0.94	0.35	0.14
M (*SD*)	4.30 (2.28)	4.61 (2.17)			
Range	0-7	0-7			
Home Language			-	0.37	-
English: Afrikaans: Xhosa: Hindi: Mixed[a]	62:11:5:1:1	89:7:7:0:2			

Note. HLOE = highest level of education. Cohen's *d*.

[a]Mixed home language refers to individuals who speak more than one language at home. 1 male participant's home languages were English and Afrikaans while 2 female participant's home languages were English and Afrikaans.

Descriptive Statistics for Affect Regulation and Social Cognition Measures

Descriptive statistics for affect regulation and social cognition measures are presented in Table 2. The ToM mean represents the average percentage (%) raw score, standardized z scores were used in the actual analysis to ensure that results are comparable across the

different age bands. Table 3 shows the descriptive statistics for the *UCT ToM Battery* per age band. Children within the 6-7 year old age band were able to understand tasks from the basic module (e.g., false beliefs) as well as some aspects of the intermediate module (second order false beliefs and strange stories). Children within the 8-10 year age band understood the intermediate module tasks and some were able to understand faux pas and distinguish between lies and jokes – tasks which form the advanced module. Lastly, children within the final age band (11-13 years) understood the contents of all four modules.

Table 2

Descriptive Characteristics of Affect Regulation and Social Cognition Measures

Measures	Mean	Std. Deviation	Range
Parent Report Measure of Affect Regulation *(ARC)*	13.09	4.27	0 - 24
Direct Measure of ToM *(UCT ToM Battery)*	57.96	23.67	6.45 – 95.16
Parent Report Measure of Empathy *(QCAE)*	67.37	13.67	37 - 106

Note. ToM = Theory of Mind. QCAE = Questionnaire of Cognitive and Affective Empathy. ARC = Affect Regulation Checklist.

Table 3

Descriptive Characteristics for UCT ToM Battery per Age Band

Age Band	Mean	Std. Deviation	Range
6 to 7 years old	26.76	10.51	6.45 – 48.39
8 to 10 years old	55.73	19.30	25.81 – 87.90
11 to 13 years old	72.26	16.45	27.02 – 95.16

Associations between Predictor and Outcome Variables

Affect regulation and Theory of Mind (ToM). Affect regulation was not significantly correlated with ToM, r (183) =0.06, p=0.22 (Table 4). However, the strongest correlation was between general intellectual functioning (IQ) and ToM. Participant IQ scores were significantly positively correlated with ToM scores, r (183) =0.31, p <0.001, likewise working memory had a significant positive correlation with ToM, r (183) =0.29, p <0.001 (Table 4). Therefore, as participant IQ and working memory scores increased so did their ToM score. In addition, Maternal HLOE (Primary school) was significantly negatively

correlated with ToM, r (183) =-0.24, $p < 0.001$ (Table 4). Therefore, participants whose mothers' HLOE was primary school had significantly lower ToM scores in comparison to participants whose mother's HLOE was at a tertiary level.

Affect regulation and Empathy. Affect regulation was not significantly correlated with Empathy, r (183) =0.03, p=0.34 (Table 5). The only other significant correlation was between age and empathy, there was a significant negative correlation between the two variables, r (183) =-0.14, p=0.02 (Table 5). Therefore, in this study, as age increased, empathy decreased.

Multicollinearity. No issues with multicollinearity were noted. Although several predictor variables had significant inter-correlations (see Table 4 and 5), the collinearity diagnostics, VIF and tolerance values, showed that this was unproblematic (see Appendix G).

Table 4
Correlation Matrix for *Affect Regulation (ARC) and Theory of Mind (ToM).*

Predictor Variables	1	2	3	4	5	6	7	8	9	10	11
1. ToM											
2. Age	.12	-									
3. IQ	.31***	.02	-								
4. Working Memory	.29***	.12	.41***	-							
5. Gender=Female	.06	.07	-.03	-.02	-						
Maternal HLOE											
6. High School Education	.02	-.05	-.03	.03	-.08	-					
7. Primary School Education	-.24***	-.02	-.32***	-.19*	.04	-.36***	-				
Total Family Income											
8. 275 001-475 000	.03	-.02	.09	-.10	.06	-.01	.02	-			
9. 475 001-675 000	.04	.08	.02	-.02	.04	.08	-.05	-.07	-		
10. 75 001-275 000	.05	.01	.15*	.21*	.00	-.04	-.13*	-.33***	-.16*	-	
11. ARC	.06	.09	.01	-.09	-.06	-.12	-.00	.14*	.06	.02	-

Note. *ToM = Theory of Mind*. HLOE = Highest Level of Education. *ARC = Affect Regulation Checklist*. Maternal HLOE: reporting on levels (dummy variables) – high school education; primary school education; tertiary education (reference category). Total Family Income: reporting on levels (dummy variables) – 0-75 000 (reference category); 75 001-275 000; 275 001-475 000; 475 001-675 000.
*p<0.05, ***p<0.001

Table 5
Correlation Matrix for Affect regulation (ARC) and Empathy (QCAE)

Predictor Variables	1	2	3	4	5	6	7	8	9	10	11
1. QCAE	-										
2. Age	-.14*	-									
3. IQ	-.06	.02	-								
4. Working memory	-.06	.12	.41***	-							
5.Gender=Female	.01	.07	-.03	-.02	-						
Maternal HLOE											
6. High School Education	.03	-.05	-.03	.03	-.08	-					
7. Primary School Education	-.11	-.02	-.32***	-.19*	.04	-.36***	-				
Total Family Income											
8. 275 001-475 000	.11	-.02	.09	-.10	.06	-.01	.02	-			
9. 475 001-675 000	-.02	.08	.02	-.02	.04	.08	-.05	-.07	-		
10. 75 001-275 000	-.01	.01	.15*	.21*	.00	-.04	-.13*	-.33***	-.16*	-	
11. ARC	.03	.09	.01	-.09	-.06	-.12	-.00	.13*	.06	.02	-

Note. *QCAE = Questionnaire of Cognitive and Affective Empathy*. HLOE = Highest Level of Education. *ARC = Affect Regulation Checklist.* Maternal HLOE: reporting on levels (dummy variables) – high school education; primary school education; tertiary education (reference category). Total Family Income: reporting on levels (dummy variables) – 0-75 000 (reference category); 75 001-275 000; 275 001-475 000; 475 001-675 000.
*p<0.05, ***p<0.001

Predictors of Social Cognition.

A hierarchical multiple regression analysis was employed to investigate the relationship between a child's affect regulation and their social cognition (ToM and empathy). A number of variables that are known to be associated with the outcome variables (ToM and Empathy) were also added into the model. These variables (age, IQ and working memory (entered as a block), gender, maternal HLOE and annual family income (entered as a block) were added into the model first followed by affect regulation (the variable of interest) in order to determine whether affect regulation predicted social cognition (ToM and empathy) over and above the known covariates.

Affect regulation and ToM. In Table 6 below, the effect size value, R^2 =0.17, indicated that the final model explained 17% of the variance in ToM. However, the change in R^2 was not significant (p =0.37), meaning, the addition of affect regulation did not improve the fit of the model over and above the variables added in the previous steps. Therefore, we conclude that affect regulation did not significantly predict ToM, R^2 *change*= 0.00, F (1,174) = 0.81, p = 0.37.

In terms of the covariates, the addition of IQ and working memory resulted in a significant change in ToM, when added into the model. They explained a further 12% of the variance in ToM F (1,174) = 12.87, p <0.001, i.e., IQ and working memory significantly predicted ToM. Moreover, the higher participants' IQ and working memory, the better their ToM score (β = 0.19) (Table 7). Conversely, participants whose mothers' HLOE was primary school had significantly lower ToM scores in comparison to participants whose mother's HLOE was at a tertiary level (β = -0.16)

Overall, the final model was statistically significant F (10,174) = 3.51, p <0.001, however this was not due to the effect of the variable of interest, affect regulation, on the model, rather it was mainly due to the addition of IQ and working memory into the model.

Table 6

Model Summary of the Predictors of ToM

					Change Statistics			
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.12[a]	.01	.01	.99	.01	2.61	1	183	.19
2	.37[b]	.14	.12	.93	.12	12.87	2	181	<.001
3	.38[c]	.14	.12	.93	.00	.89	1	180	.35
4	.40[d]	.16	.12	.93	.02	.96	5	175	.44
5	.41[e]	.17	.12	.93	.00	.81	1	174	.37

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, IQ Score, Working memory

c. Predictors: (Constant), Age, IQ Score, Working memory, Gender=Female

d. Predictors: (Constant), Age, IQ Score, Working memory, Gender=Female, TotalFamilyIncome=475 001-675 000, MaternalHLOE=High School Education, TotalFamilyIncome=275 001-475 000, TotalFamilyIncome=75 001-275 000, MaternalHLOE=Primary School Education

e. Predictors: (Constant), Age, IQ Score, Working memory, Gender=Female, TotalFamilyIncome=475 001-675 000, MaternalHLOE=High School Education, TotalFamilyIncome=275 001-475 000, TotalFamilyIncome=75 001-275 000, MaternalHLOE=Primary School Education, ARC

f. Dependent Variable: ToM

Table 7
Coefficients for Predicting ToM

Model	Predictor Variables	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
5	(Constant)	-1.79	.52		-3.47	<.001
	Age	.00	.00	.08	1.07	.29
	IQ Score	.04	.02	.19	2.27	.02*
	Working memory	.04	.02	.19	2.40	.02*
	Gender=Female	.15	.14	.07	1.04	.30
	MaternalHLOE=High School Education	-.05	.16	-.03	-.34	.73
	MaternalHLOE=Primary School Education	-.61	.30	-.16	-2.03	.04*
	TotalFamilyIncome=275 001-475 000	.04	.23	.01	.18	.86
	TotalFamilyIncome=475 001-675 000	.06	.40	.01	.16	.87
	TotalFamilyIncome=75 001-275 000	-.07	.16	-.04	-.48	.63
	ARC	.02	.02	.06	.90	.37

Note. ToM = Theory of Mind. HLOE = Highest Level of Education. *ARC = Affect Regulation Checklist*
*p<0.05

Affect regulation and Empathy. The effect size, R^2 =0.06 indicated that the final proposed model explained 6% of the variance in empathy, however, the change in R^2 was not significant (p =0.77). This shows that the addition of affect regulation did not improve the fit of the model over and above the variables added in the previous steps. Therefore, we conclude that affect regulation did not significantly predict empathy, R^2 *change*= 0.00, F (1,174) = 0.09, p = 0.77 (Table 8). None of the other covariates significantly contributed to the model (see Table 8) and none of their coefficients were significant (see Table 9). Therefore, there were no significant predictors of empathy.

Furthermore, the overall final model was not statistically significant F (10,174) = 1.15, p = 0.32. No previous steps in the model reached significance, however, the first step in the model, the addition of age, was on the threshold of significance, F (1,183) = 3.92, p =

0.05. Moreover, the coefficients for age and maternal HLOE for primary school were also on the threshold of significance, $p = 0.05$ (Table 9).

Table 8
Model Summary of the Predictors of Empathy

					Change Statistics			
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.14[a]	.02	.02	13.56	.02	3.92	1	183	.05
2	.16[b]	.03	.01	13.60	.00	.38	2	181	.69
3	.16[c]	.03	.00	13.64	.00	.06	1	180	.81
4	.25[d]	.06	.01	13.57	.04	1.36	5	175	.24
5	.25[e]	.06	.01	13.61	.00	.09	1	174	.77

a. Predictors: (Constant), Age
b. Predictors: (Constant), Age, IQ Score, Working memory
c. Predictors: (Constant), Age, IQ Score, Working memory, Gender=Female
d. Predictors: (Constant), Age, IQ Score, Working memory, Gender=Female, TotalFamilyIncome=475 001-675 000, MaternalHLOE=High School Education, TotalFamilyIncome=275 001-475 000, TotalFamilyIncome=75 001-275 000, MaternalHLOE=Primary School Education
e. Predictors: (Constant), Age, IQ Score, Working memory, Gender=Female, TotalFamilyIncome=475 001-675 000, MaternalHLOE=High School Education, TotalFamilyIncome=275 001-475 000, TotalFamilyIncome=75 001-275 000, MaternalHLOE=Primary School Education, ARC
f. Dependent Variable: QCAE

Table 9
Coefficients for Predicting Empathy

		Unstandardized Coefficients		Standardized Coefficients		
Model	Predictor Variables	B	Std. Error	Beta	t	Sig.
5	(Constant)	82.05	7.54		10.88	<.001
	Age	-.08	.04	-.15	-1.96	.05
	IQ Score	-.34	.24	-.13	-1.44	.15
	Working memory	-.04	.25	-.01	-.18	.86
	Gender=Female	.40	2.05	.01	.19	.85
	MaternalHLOE=High School Education	-1.04	2.29	-.04	-.46	.65
	MaternalHLOE=Primary School Education	-8.81	4.39	-.17	-2.01	.05
	TotalFamilyIncome=275 001-475 000	5.13	3.36	.12	1.53	.13
	TotalFamilyIncome=475 001-675 000	-.33	5.86	.00	-.06	.96
	TotalFamilyIncome=75 001-275 000	.70	2.26	.03	.31	.76
	ARC	.07	.24	.02	.29	.77

Note. QCAE = Questionnaire of Cognitive and Affective Empathy. HLOE = Highest Level of Education. *ARC = Affect Regulation Checklist*

Discussion

The aim of this study was to investigate the relationship between a child's affect regulation and their social cognition (ToM and empathy). Based on the literature reviewed, this study inferred that an increased ability to regulate one's affect would result in greater ToM and empathic ability. Two hypotheses were therefore proposed, the first that affect regulation would positively predict participants' ToM over and above the effects of the covariates – age, IQ, working memory, gender, annual family income and maternal HLOE. The second hypothesis was that affect regulation would positively predict participants' empathy over and above the effects of the covariates.

Affect Regulation as a Predictor of ToM

The first analysis investigated the association between affect regulation and ToM. It was hypothesized that affect regulation scores would positively predict children's Theory of Mind scores over and above any effects of age, IQ and working memory, gender, annual family income or maternal HLOE. The results indicated that participants' affect regulation was not significantly correlated with their ToM. With regard to the covariates, IQ and working memory were significantly positively correlated with ToM and maternal education (primary school) was significantly negatively correlated with ToM. The overall multiple regression analysis for affect regulation and ToM was statistically significant. However, this was due mainly to the effects of IQ and working memory on the model and not due to the effect of affect regulation on the model. The first hypothesis was thus rejected as according to the study results, affect regulation does not predict a child's ToM.

The positive associations between IQ and working memory with ToM suggested that as one's IQ and working memory increase so does their ToM ability. Research supports the positive association between ToM, IQ and working memory (Hasselhorn et al., 2005; Isaksson et al., 2021; Lecce & Bianco, 2018; Pequet & Warnell, 2021). To elaborate further, Isaksson et al. (2021), in their study examining the link between ToM and other cognitive abilities, found that a higher IQ was associated with a better ToM ability. Moreover, Ibanez et al. (2013) found that fluid intelligence positively predicted ToM ability (assessed using the Reading the Mind in the Eyes – RMET) in a sample of 424 secondary school children (aged 12 and 13 years old). Additionally, the results of a meta-analysis examining the relationship between IQ and performance on the RMET test, showed that performance on the RMET was positively correlated with IQ (Baker et al., 2014). Based on these research findings which

show that children with a higher IQ also have higher ToM scores on testing, one could argue that this association indicates that IQ subserves or promotes ToM.

Regarding the relationship between working memory and ToM, research shows that working memory positively predicts pre-schoolers' ToM performance and plays a significant role in the development of ToM (Gordon & Olson, 1998; Hughes, 1998; Keenan et al., 1998). Researchers have also found that early working memory ability predicts children's later ToM ability. For example, Austin et al. (2014) studied the longitudinal (1 year) relationship between three executive function components (attention shifting, working memory and inhibition) and ToM in children aged 6 to 12. They found strong evidence that early attentional shifting and working memory ability predicts later ToM. Similarly, Lecce et al. (2017) found that early working memory predicted later ToM in children aged 9 and 10. They too concluded that working memory contributes to the development of ToM. Moreover, Hasselhorn et al. (2005) reported that phonological working memory is important for ToM development in children. For example, solving false belief tasks – particularly second-order false beliefs tasks, requires greater information processing as keeping in mind the main details of the false belief story is essential to understanding and solving such a complex problem (Hasselhorn et al., 2005). In other words, a greater ability to hold in mind and simultaneously process bits of information enables children to think about and integrate various perspectives on the same event, which then allows them to generate a coherent view of the event they have to explain (Lecce and Bianco, 2018). Hasselhorn et al. (2005) concluded that children who are developmentally more developed with respect to phonological working memory are also more developed in their ToM ability.

Children's ToM ability was also associated with maternal education in this study. The negative association between maternal education (primary school) and participant ToM illustrated that participants whose mother's HLOE was primary school had a lower ToM score in comparison to participants whose mothers' HLOE was at a tertiary level. Other researchers have also reported similar results. For example, in a study examining the relationship between demographic variables and ToM in 142 preschool-aged children (aged 3 to 5), Pears and Moses (2003) found that out of all the parental variables included in their study, maternal education was the strongest predictor of children's ToM. They reported that maternal education had a positive moderate correlation with participant performance on the study's ToM tasks (perception, desire, and emotional understanding tasks). Moreover,

Cutting and Dunn (1999) in their sample of 128 pre-schoolers, found that maternal education was highly correlated with children's performance on the false-belief task. Similarly, Meins et al. (2002), found that children's (aged 3 to 4) ToM performance was positively correlated with maternal level of education. Children who performed the best on the ToM tasks had mothers who had a high education level (Meins et al., 2002). Furthermore, in a longitudinal study (3 years) investigating the development of ToM in 5 year old children, Ketelaars et al. (2010), found that maternal education level persistently correlated (positive correlation) with children's ToM ability throughout the 3 year period.

Pears and Moses (2003) explained that maternal education may have direct effects on children's ToM as mothers with a high education level may spend more time explaining social interactions and phenomena to their children in comparison to mothers with a lower education level. Mothers with higher education levels would therefore make use of mental state language when interacting with their children. Maternal use of mental state language has been positively associated with children's ToM performance (Laranjo et al., 2014; Meins et al., 2002; Nelson, 2005; Ruffman et al., 2002). Meins et al. (2002), in their longitudinal study investigating the association between social interaction during infancy and children's ToM, found that children whose mothers made use of mental state language when they were 6 months old performed better on ToM tasks at 3 and 4 years old. Furthermore, the authors concluded that mother's use of mental state language positively predicted their children's overall ToM performance (Meins et al., 2002). Another longitudinal study by Ensor et al. (2014) found that mother's mental state language when children were 2 years old, predicted children's later ToM at 6 and 10 years old. ToM was assessed using false belief tasks and Strange Stories.

On can infer that mothers who make use of mental state language when interacting with their children most likely treat them as individuals with a mind of their own and do not misread their child's mental state (thoughts, feelings etc.). This is known as maternal mind-mindedness (McMahon & Bernier, 2017). Researchers have reported that maternal mind-mindedness plays an important role in children's acquisition of ToM. This is because a mother's discourse around mental states facilitates their child's awareness of their own and other's mental states as well as their understanding of themselves and others as mental agents (see McMahon & Bernier, 2017, for a review). In a longitudinal study examining the link between maternal mind-mindedness in infancy and ToM development, Kirk et al. (2015)

found that children's ToM performance at 5 and 6-years old was significantly predicted by their mother's mind-mindedness when they were infants. Similarly, other researchers have reported positive connections between maternal mind-mindedness and children's ToM ability (Laranjo et al., 2014; Lundy, 2013; Meins et al., 2013). One could argue that mothers with a lower education level may make less use of mental state language when interacting with their children. Moreover, based on research findings, mothers who make use of mental state language also likely have higher maternal mind mindedness which has been positively associated with children's ToM development. Hence one can infer that mothers with a low education level, make less use of mental state language and likely have lower maternal mind mindedness which in turn negatively affects their children's ToM development and ability.

Affect Regulation as a Predictor of Empathy

The second analysis investigated the association between affect regulation and empathy. It was hypothesized that affect regulation scores would positively predict children's empathy scores over and above any effects of age, IQ and working memory, gender, annual family income or maternal HLOE. The results indicated that participants' affect regulation was not significantly correlated with empathy. With regard to the covariates, age was the only covariate that was correlated with empathy. There was a significant negative correlation between them, meaning that as children's age increased, their empathy scores on the QCAE decreased. In other words, older children had lower empathy scores in comparison to younger children in the study.

The overall multiple regression analysis for affect regulation and empathy was not statistically significant and none of the covariates significantly contributed to the model. There were therefore no significant predictors of empathy and the second hypothesis was thus rejected as according to the study results, affect regulation does not predict a child's empathy.

The negative association between age and empathy suggested that as participants' age increased, their empathy scores decreased. This is unusual as literature shows that empathy develops as one becomes older, hence it should increase with age and not decrease. For example, mimicry in infancy represents the development of empathy (Brown et al., 2017; Goldstein, 2010) and infants cry upon hearing other infants cry (Decety, 2010; Stietz et al., 2019). As babies grow, they tend to move toward those in distress in an attempt to comfort them and between 2 to 3 years old, children understand emotion and can separate and differentiate their feelings from those of others (Decety, 2010; Goldstein, 2010).

Furthermore, empathy increases during middle childhood. Some researchers have suggested there may be a decrease in adolescents' empathic response (i.e., responding in an empathic manner to those in distress), however, self-report measures indicate empathy increases throughout this developmental period (Goldstein, 2010). Researchers have also reported interesting developmental patterns that emerge during the transition into adolescence. For example, for both girls and boys, empathy increases during the transition from middle childhood into early adolescence however it begins to 'plateau' or level off for girls at around 12 to 13 years old and remains stable into adolescence (Lam et al., 2012; Van der Graaf et al., 2014). On the other hand, for boys, empathy tends to decrease during this period (Lam et al., 2012). Van der Graaf et al. (2014) reported in their study, that boy's empathy decreases between 13 to 16 years old and then increases and returns to its initial level. Perhaps this could account, at least in part, for the negative association observed between age and empathy in this study. To explain further, empathy scores in this study are lower for older children because they are at the age where their empathy levels may have already either reached a plateau or decreased. Whereas with the younger children in the study, their empathy scores are higher as they have not yet reached the age where their empathy levels have either plateaued or decreased, unlike the older children. This could explain the relationship observed in the study between age and empathy, where parents of older children reported their children have lower empathy while parents of younger children reported the opposite.

Another possible explanation for the negative relationship between age and empathy observed in this study could be explained by the time parents spend with their children. Although speculative, perhaps parents spend less time with older children, hence they do not frequently see their children in a variety of social settings in comparison to younger children. For example, with younger children, parents accompany them on play dates, or to social parks where they would be privy to their social interactions with other children (peers and friends). Whereas with older children, because parents spend less social time with them, and as a result they have limited opportunities to witness their children's displays of empathy, they therefore only know what they have seen. For example, if they do not see their children sharing at home, then when answering questions about whether or not their children share, they may answer that they do not share with others as this may be what they have witnessed when they were with their children. So, they assume their children would behave in the same

manner when they are not together in other social settings. This would therefore negatively affect parental reports of their children's empathy when completing the QCAE, leading to lower empathy scores for older children and it would seem as though older children are less empathic in comparison to younger children.

Difficulties with exclusive use of parent reports. This study relied on parent reports as many of the children (10 years old and younger) were not able to comment reliably on their own internal states. Having that sort of insight and understanding comes later in development, for this reason, this study was not able to include child self-report measures, although it would have been ideal.

Nevertheless, the exclusive use of parent reports of their children's affect regulation (ARC), and empathy (QCAE) instead of self-reports or direct observational measures could account for the non-significant results. Sánchez-Pérez et al. (2014) in their study investigating cognitive and affective empathy (using the Spanish version of the BES) in children (aged 6 to 12), found low concordance between parent and self-report responses on the BES. The authors found that parents scored their children's empathy much higher compared to their children's self-reports. Sánchez-Pérez et al. (2014) explained that it was not unusual to observe low parent-child agreement as the nature of the phenomena being measured as well as the context of observations could explain this. To elaborate further, the authors explained that empathy (both cognitive and affective) can be regarded as an internal state, with children and their parents possibly using dissimilar strategies when responding to items on the BES. Parents had to deduce their children's mental states based upon their children's observable behaviours – as they do not have access to their children's internal world, while children were informed about their own reactions (they understood the reason for their behaviours). This difference may have led to the low parent-child convergence on the BES. A second explanation proposed by the authors relates to the contexts in which parents observe their children's behaviour. For example, parents' observations may have been limited to the family context, hence, their responses on the BES were centred within that particular context. While their children's emotional experiences could be much more varied as they find themselves coping with others' emotions in multiple contexts (Sánchez-Pérez et al., 2014). The authors concluded that both parent and child reports provide important knowledge about children's socio-emotional development. However, they should not be considered equivalent, rather they should be viewed as complementary sources of information (Sánchez-Pérez et al., 2014).

The above mentioned points pertain to affect regulation and the ARC as well. The ARC measures three affect regulation strategies: affect dysregulation (a deficit in adaptive affect regulation strategies following emotional distress), affect suppression (the avoidance of emotions either by inhibiting them or avoiding them through distraction) and reflection (identification, acceptance, and reflection of emotions in order to obtain insight into oneself) which all look at the regulation of affect (an internal characteristic) (Goulter et al., 2022). Parents may be able to easily observe affect dysregulation in their children as it may manifest clearly in their behaviour. For example, their children may become visibly overwhelmed by their emotions (e.g., throw a tantrum) as they are unable to effectively regulate them. Moreover, their children may take a long time to calm down when they are upset, which is something that parents can observe. Whereas it is much more difficult for parents to observe children's affect suppression. When upset, children may distract themselves by engaging in different activities to avoid dealing with their unpleasant emotions. When parents see them, it would be difficult for parents to know that their child is actually attempting to avoid dealing with their unpleasant feelings through distraction. They may even misinterpret their child's behaviour and assume they have already dealt with their unpleasant feelings and have now moved on hence they are engaging in a different activity. Moreover, parents cannot observe that their children feel that it is best to keep their feelings in control or to not think about them – which is another form of affect suppression. Similarly, it would not be easy for parents to observe their children's usage of reflection, which involves constructively exploring and reflecting on one's emotions to gain insight into oneself. Parents cannot observe that their children prefer to think or reflect on why they have different feelings as it helps them understand themselves better.

Hourigan et al. (2011) investigated discrepancies in parent and child reports of affect regulation, focusing specifically on affect suppression (the authors referred to it as inhibition in their study) and dysregulation strategies. Sixty-one children between the ages of 7 and 12 years old and their mothers participated in the study. The authors predicted that there would be a greater discrepancy between parent and child reports for inhibition (which is covert and relatively unobservable) than dysregulation (highly observable). The results were consistent with their prediction. The authors explained that parents are not able to directly observe their children's internal emotional states. Even observable expressions of affect regulation are dependent on the observer's (in this case parents) opportunity to observe their children's

affect regulation. Furthermore, they explained that research shows that children report expressing emotion differently when in the company of different parents or caregivers (Hourigan et al., 2011). As a result, parents or caregivers who complete affect regulation report measures on behalf of their children may not even have access to the wide range of their children's emotional functioning (Hourigan et al., 2011). They would therefore have limited knowledge when it comes to their children's usage of different affect regulatory strategies.

In terms of parent-child congruence using the ARC, Goulter et al. (2022), examined the ARC's psychometric properties within community and clinical samples using both parent and child self-reports. The clinical sample comprised of children, parents and/or caregiver from a program that supports parents of children with behavioural and socio-emotional difficulties in Canada. The community sample included parents (or caregivers) and children from different communities located in Canada. The authors found that among parents, across both samples (clinical and community) affect dysregulation was positively correlated with affect suppression, which were both negatively correlated with reflection. Among children, affect dysregulation, suppression, and reflection were all positively correlated, except in the community sample where suppression and reflection were negatively correlated. The authors explained that the findings suggest that dysregulation, suppression, and reflection may be interpreted differently by parents and children. Moreover, they suggest that their findings may be reflective of evaluative consistency bias (the propensity to constantly view a range of characteristics positively or negatively) (Goulter et al., 2022). For example, parents who are concerned about their child's behaviour or mental health may assume their child is performing poorly across a range of domains – e.g., they view their child as having high affect dysregulation and suppression (both maladaptive strategies) and therefore low reflection (Goulter, et al., 2022). The opposite also applies, parents who are not concerned about their children's behaviour or mental health may report their child has low affect dysregulation and suppression and therefore high reflection. Goulter et al. (2022) emphasize the importance of considering children's self-reports of affect regulation as highly as parent reports as they offer valuable information – specifically for unobservable characteristics. Children may also be more knowledgeable of their emotions in comparison to their parents (Goulter et al., 2022). The authors concluded that the ARC should be completed by both parents (and/or caregivers) and children.

Other difficulties with parent report measures (specifically questionnaire measures) include; personal biases, parental emotional state, their attitude toward their child as well as their expectations and overall understanding of the questionnaire aims (Coutinho et al., 2017; Gardner, 2000). Additionally, when understanding a question, variables such as vocabulary, syntax, grammar as well as interviewer involvement affect how the respondent interprets and responds to a question (Morsbach & Prinz, 2006). Direct measures, on the other hand are not dependant on these factors (Coutinho et al., 2017). For example, direct observational measures allow the researcher to directly view and study the construct of interest (Gardner, 2000). Furthermore, with direct observational data, although observer bias can emerge, it can be mitigated through the development of coding schemes (ensuring that all participants are scored against the same criteria) and the use of inter-rater reliability (Gardner, 2000; Herbers et al., 2017). Miller et al. (2017) suggest that even though parent report and direct assessment measures both have their strengths (e.g., parents have greater insight into children's abilities; direct measures are administered by professionals who offer an unbiased assessment of the child) and weaknesses (e.g., parent reports are subjective and prone to personal bias; direct measures are prone to participant performance anxiety), utilising both measures allows for a greater level of understanding of the construct of interest.

However, despite the advantage of including both questionnaire and direct observational measures within one's study, they too are often not well correlated. For example, in their study of empathy and clinical competence in medical school studies, Ogle et al. (2013) found no significant correlation between self-reported and observer ratings of empathy. In their study, self-reported empathy was assessed using the Jefferson Scale of Physician Empathy–Student Version (JSPE-S), while observers used the Rating Scales for the Assessment of Empathic Communication in Medical Interviews (REM) to rate students' empathy. Observers watched an objective structured clinical examination (OSCE) between students and patients and then rated their empathy via the REM. The authors explained that the JSPE-S measured students' internal disposition and attitudes toward empathy (based on their entire life experience) while the observer ratings measures students' observable behavioural expressions of empathy (within one particular context). In other words, they assessed different aspects of the nature of empathy. It is therefore important that researchers take note of the discrepancies that exist between parent and self-report measures as well as

between direct observational or questionnaire based measures when selecting what measures to use in their study and when interpreting study results.

Limitations and Considerations for Future Research

Standardisation. This study utilised data that was previously collected for a larger study over the past few years, by a team of different researchers. Therefore, the measures were not always administered and scored by the same researcher. Although the various research assistance (RAs) were all well-trained by the project manager, over time some RAs may have deviated from initial instruction. Hence it would have been difficult to ensure that standardisation guidelines were followed accurately by each researcher over the years of data collection. Future research should aim to have site checks and direct observations of trainees during the data collection process in order to maintain standard administration of study measures. Moreover, if future studies do make use of data that has been previously collected, it is important to have direct communication with previous researchers involved in the original data collection process to ensure that questions or concerns around the data are promptly addressed and adjustments can be made.

Parent Report Measures. The parent report versions of the ARC and the QCAE were used in the study as measures of participants' affect regulation and empathy. As discussed above, parent report measures are influenced by a number of factors. It would therefore be beneficial for future research to include in their studies direct measures of participants' affect regulation and empathy alongside the parent report measures. An example of a direct task includes home or laboratory based observations of parent-child or child-peer interactions while engaged in games designed to measure affect regulation and/or empathy. Independent observers could then rate participants' affect regulation and empathy. Another task could involve showing participants pictures, videos or visual stories which are designed to evoke emotion, thereafter they will be asked questions related to empathy. Despite the challenges associated with parent reports future studies could make use of both parent and child report measures (particularly with older children) in their studies. The inclusion of both reports would allow for comparison of the results thereby enriching the study's data and the researcher's understanding of the construct of interest.

Study Design. This study employed a cross sectional design where children's affect regulation and social cognition were measured concurrently, at one time point. It is possible that children in the study may have only recently developed affect regulatory strategies

however, these strategies did not have sufficient time to affect their social cognition abilities. Hence, it may be that the study's design, had not allowed sufficient time for these abilities to interact, thus no significant results were observed. Furthermore, perhaps other studies employed a different design, e.g., a longitudinal design, which could explain why no significant results emerged in this study. To elaborate, a longitudinal design would provide the opportunity to measure the effects affect regulation has on children's social cognition across time (e.g., 6 months or 1 year) or developmental stages. Moreover, one would also have the opportunity to assess whether a child's early affect regulation predicts their later social cognition abilities – ToM and empathy.

Representativeness of the Sample. The majority of children in the study were from low to middle income schools and communities, moreover, most of the mother's HLOE were primary or high school, very few mothers had a tertiary education level. Secondly, the majority of children in the study were children of colour- most were of mixed ancestry. In other words, our sample was ethnically homogenous and not reflective of the ethnic diversity that exists within the South African population. Additionally, because measures were administered in English, the study only included children whose language of schooling was also English. This excluded a range of children who are schooled in other South African languages. Future studies would do well to include children from a wide range of racial groups, languages, and different SES backgrounds within South Africa to ensure that the sample is representative of the South African population. This will further ensure that the study findings can be generalisable to the entire South African youth population.

Missing Data. Given that this study utilised data that was previously collected for a larger study over the past few years, there was the issue of missing data for a few of the study participants, this is a common limitation in long studies. This study therefore employed multivariate imputation (MI), which is a well-recognised method, to mitigate the issue of missing data. However, ideally it would have been best to have all data present.

Summary and Conclusions

The aim of the study was to examine the relationship between affect regulation and social cognition (ToM and empathy) in children. Results illustrated that no association was found between them, i.e., affect regulation did not predict ToM or empathy. A possible explanation for the non-significant results could be attributed to the exclusive usage of parent report measures of affect regulation and empathy, instead of direct measures. Additionally,

using data that has been previously collected by various researchers may have affected standardisation. Moreover, the sample was not entirely representative of the South African youth population. Although no significant association was found between the main variables (affect regulation and social cognition – ToM and empathy), this study nevertheless adds to the literature on the relationship between affect regulation and social cognition in non-clinical samples as studies investigating the association between these constructs (specifically between affect regulation and ToM), tend to focus on studying them in clinical samples. Moreover, despite no association between the main variables, the study did find significant correlations between covariates, IQ, working memory, and maternal education with ToM. These associations have been well-established in the literature, which gives some reassurance regarding this study's data. Future research could investigate affect regulation and social cognition using direct measures instead of or in conjunction with parent report measures. Additionally, studies should include a more inclusive sample to allow for generalisability of study findings.

References

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, *30*(2), 217-237. doi:10.1016/j.cpr.2009.11.004

Altum, D. (2019). Young Children's Theory of Mind: Home Literacy Environment, Technology Usage, and Preschool Education. *Journal of Education and Training Studies, 7*(3), 86-98. doi:10.11114/jets.v7i3.4057

Amanda, G., & Salim, R. M. A. (2019). Children's empathy and family income: The mediating role of family communication pattern. *Humaniora, 10*(2), 121-126. doi:10.21512/humaniora.v10i2.5510

Austin, G., Groppe, K., & Elsner, B. (2014). The reciprocal relationship between executive function and theory of mind in middle childhood: A 1-year longitudinal perspective. *Frontiers in psychology, 5*, 655. doi:10.3389/fpsyg.2014.00655

Baglio, G., Blasi, V., Sangiuliano Intra, F., Castelli, I., Massaro, D., Baglio, F., Valle, A., Zanette, M., & Marchetti, A. (2016). Social competence in children with borderline intellectual functioning: delayed development of theory of mind across all complexity levels. *Frontiers in psychology, 7*, 1604. doi:10.3389/fpsyg.2016.01604

Baker, C. A., Peterson, E., Pulos, S., & Kirkland, R. A. (2014). Eyes and IQ: A meta-analysis of the relationship between intelligence and "Reading the Mind in the Eyes". *Intelligence, 44*, 78-92. doi:10.1016/j.intell.2014.03.001

Baron-Cohen, S., O'Riordan, M., Stone, V., Jones, R., & Plaisted, K. (1999). Recognition of faux pas by normally developing children and children with Asperger syndrome or high-functioning autism. *Journal of autism and developmental disorders*, *29*(5), 407-418. doi:10.1023/a:1023035012436

Baron-Cohen, S., Richler, J., Bisarya, D., Gurunathan, N., & Wheelwright, S. (2003). The systemizing quotient: an investigation of adults with Asperger syndrome or high–functioning autism, and normal sex differences. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, *358*(1430), 361-374. doi:10.1098/rstb.2002.1206

Bartels, A., & Zeki, S. (2000). The neural basis of romantic love. *NeuroReport*, *11*(17), 3829–3834. doi:10.1097/00001756-200011270-00046

Bartels, A., & Zeki, S. (2004). The neural correlates of maternal and romantic love.

NeuroImage, 21(3), 1155–1166. doi :10.1016/j.neuroimage.2003.11.003

Bensalah, L., Caillies, S., & Anduze, M. (2016). Links among cognitive empathy, theory of mind, and affective perspective taking by young children. *The Journal of genetic psychology*, *177*(1), 17-31. doi:10.1080/00221325.2015.1106438

Blair, R. J. R. (2005). Responding to the emotions of others: Dissociating forms of empathy through the study of typical and psychiatric populations. *Consciousness and cognition*, *14*(4), 698-718. doi:10.1016/j.concog.2005.06.004

Bridges, L. J., Denham, S. A., & Ganiban, J. M. (2004). Definitional issues in emotion regulation research. *Child development*, *75*(2), 340-345. doi:10.1111/j.1467-8624.2004.00675.x

Brown, M. M., Thibodeau, R. B., Pierucci, J. M., & Gilpin, A. T. (2017). Supporting the development of empathy: The role of theory of mind and fantasy orientation. *Social Development*, *26*(4), 951-964. doi:10.1111/sode.12232

Calero, C. I., Salles, A., Semelman, M., & Sigman, M. (2013). Age and gender dependent development of Theory of Mind in 6-to 8-years old children. *Frontiers in human neuroscience*, *7*, 1-7. doi:10.3389/fnhum.2013.00281

Calkins, S. D. (2007). The emergence of self-regulation: Biological and behavioral control mechanisms supporting toddler competencies. In C. A. Brownell & C. B. Kopp (Eds.), *Socioemotional development in the toddler years: Transitions and transformations* (p. 261–284). The Guilford Press.

Charman, T., Ruffman, T., & Clements, W. (2002). Is there a gender difference in false belief development?. *Social development*, *11*(1), 1-10. doi:10.1111/1467-9507.00183

Christov-Moore, L., Simpson, E. A., Coudé, G., Grigaityte, K., Iacoboni, M., & Ferrari, P. F. (2014). Empathy: Gender effects in brain and behavior. *Neuroscience & biobehavioral reviews*, *46*, 604-627. doi:10.1016/j.neubiorev.2014.09.001

Cohen, D., & Strayer, J. (1996). Empathy in conduct-disordered and comparison youth. *Developmental psychology*, *32*(6), 988–998. doi:10.1037/0012-1649.32.6.988

Cole, P. M. (2014). Moving ahead in the study of the development of emotion regulation. *International Journal of Behavioral Development*, *38*(2), 203-207. doi:10.1177/0165025414522170

Conte, E., Grazzani, I., & Pepe, A. (2018). Social cognition, language, and prosocial

behaviors: A multitrait mixed-methods study in early childhood. *Early Education and Development, 29*(6), 814-830. doi:10.1080/10409289.2018.1475820

Coutinho, V., Câmara-Costa, H., Kemlin, I., Billette de Villemeur, T., Rodriguez, D., & Dellatolas, G. J. A. N. C. (2017). The discrepancy between performance-based measures and questionnaires when assessing clinical outcomes and quality of life in pediatric patients with neurological disorders. *Applied Neuropsychology: Child,* 6(4), 255-261. doi:10.1080/21622965.2016.1146141

Cutting, A. L., & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences and interrelations. *Child development, 70*(4), 853-865. doi:10.1111/1467-8624.00061

Cutuli, D. (2014). Cognitive reappraisal and expressive suppression strategies role in the emotion regulation: an overview on their modulatory effects and neural correlates. *Frontiers in systems neuroscience*, *8*. doi:10.3389/fnsys.2014.00175

Dağdelen, F. (2021). Decreased theory of mind abilities and increased emotional dysregulation in adolescents with ASD and ADHD. *Alpha Psychiatry, 22*(2), 100 00-105. doi:10.5455/apd.135050

D'Agostino, A., Covanti, S., Monti, M. R., & Starcevic, V. (2017). Reconsidering emotion dysregulation. *Psychiatric Quarterly*, *88*(4), 807-825. doi:10.1007/s11126-017-9499-6

Davidson, R. J., Putnam, K. M., & Larson, C. L. (2000). Dysfunction in the neural circuitry of emotion regulation--a possible prelude to violence. Science, 289(5479), 591-594. doi:10.1126/science.289.5479.591

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44* (1), 113–126. doi:10.1037/0022-3514.44.1.113

Decety, J. (2010). The neurodevelopment of empathy in humans. *Developmental neuroscience*, *32*(4), 257-267. doi:10.1159/000317771

Decety, J. (2011). Dissecting the neural mechanisms mediating empathy. *Emotion review*, *3*(1), 92-108. doi:10.1177/1754073910374662

Decety, J., & Jackson, P. L. (2004). The functional architecture of human empathy. *Behavioral and cognitive neuroscience reviews*, *3*(2), 71-100. doi:10.1177/1534582304267187

Decety, J., & Jackson, P. L. (2006). A social-neuroscience perspective on empathy. *Current directions in psychological science*, *15*(2), 54-58. doi:10.1111/j.0963-7214.2006.00406.x

Decety, J., & Lamm, C. (2006). Human empathy through the lens of social neuroscience. *The Scientific World JOURNAL*, *6*, 1146–1163. doi:10.1100/tsw.2006.221

Decety, J., & Meyer, M. (2008). From emotion resonance to empathic understanding: A social developmental neuroscience account. Development and psychopathology, 20(4), 1053-1080. doi:10.1017/s0954579408000503

Decety, J., & Moriguchi, Y. (2007). The empathic brain and its dysfunction in psychiatric populations: Implications for intervention across different clinical conditions. *BioPsychoSocial Medicine*, *1*(1), 22. doi:10.1186/1751-0759-1-22

Decety, J., Norman, G. J., Berntson, G. G., & Cacioppo, J. T. (2012). A neurobehavioral evolutionary perspective on the mechanisms underlying empathy. *Progress in neurobiology*, *98*(1), 38-48. doi:10.1016/j.pneurobio.2012.05.001

Decety, J., & Svetlova, M. (2012). Putting together phylogenetic and ontogenetic perspectives on empathy. *Developmental cognitive neuroscience*, *2*(1), 1-24. doi:10.1016/j.dcn.2011.05.003

Devine, R. T., & Hughes, C. (2013). Silent films and strange stories: Theory of mind, gender, and social experiences in middle childhood. *Child development*, *84*(3), 989-1003. doi:10.1111/cdev.12017

Devine, R. T., & Hughes, C. (2018). Family correlates of false belief understanding in early childhood: A meta-analysis. *Child development*, *89*(3), 971-987. doi:10.1111/cdev.12682

Dvash, J., & Shamay-Tsoory, S. G. (2014). Theory of mind and empathy as multidimensional constructs: Neurological foundations. *Topics in Language Disorders*, *34*(4), 282-295. doi:10.1097/tld.0000000000000040

Eggum, N. D., Eisenberg, N., Kao, K., Spinrad, T. L., Bolnick, R., Hofer, C., Kupfer, A. S., & Fabricius, W. V. (2011). Emotion understanding, theory of mind, and prosocial orientation: Relations over time in early childhood. *The journal of positive psychology*, *6*(1), 4-16. doi:10.1080/17439760.2010.536776

Eisenberg, N. (2005). The development of empathy-related responding. In G. Carlo

& C. P. Edwards (Eds.), *Moral motivation through the life span* (pp. 73–117). Lincoln: University of Nebraska Press

Eisenberg, N., Fabes, R. A., Guthrie, I. K., & Reiser, M. (2000). Dispositional emotionality and regulation: their role in predicting quality of social functioning. *Journal of personality and social psychology, 78*(1), 136-157. doi:10.1037/0022-3514.78.1.136

Eisenberg, N., Smith, C. L., & Spinrad, T. L. (2004). Effortful control: Relations with emotion regulation, adjustment, and effortful control. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory and applications* (pp. 263–283).

Ensor, R., Devine, R. T., Marks, A., & Hughes, C. (2014). Mothers' cognitive references to 2-year-olds predict theory of mind at ages 6 and 10. *Child development, 85*(3), 1222-1235. doi:10.1111/cdev.12186

Eysenck, S. B., & Eysenck, H. J. (1978). Impulsiveness and venturesomeness: Their position in a dimensional system of personality description. *Psychological Reports, 43*, 1247-1255. doi:10.2466/pr0.1978.43.3f.1247

Ferrett, H. L., Carey, P. D., Thomas, K. G., Tapert, S. F., & Fein, G. (2010). Neuropsychological performance of South African treatment-naive adolescents with alcohol dependence. *Drug and alcohol dependence, 110*(1-2), 8-14. doi:10.1016/j.drugalcdep.2010.01.019

Field, A. (2009). *Discovering Statistics Using SPSS* (3rd Edition). London: Sage Publications Ltd.

Friesen, K. (2019). Empathy and executive functioning in children with Attention-Deficit/Hyperactivity Disorder (Master's thesis). Werklund School of Education). https://prism.ucalgary.ca/handle/1880/110870

Garaigordobil, M. (2009). A comparative analysis of empathy in childhood and adolescence: Gender differences and associated socio-emotional variables. *International journal of psychology and psychological therapy, 9*(2), 217-235. https://www.researchgate.net/profile/Maite-Garaigordobil/publication/28299634_A_comparative_analysis_of_empathy_in_childhood_and_adolescence_Gender_differences_and_associated_socio-emotional_variables/links/0fcfd50fd8744eb840000000/A-comparative-analysis-of-

empathy-in-childhood-and-adolescence-Gender-differences-and-associated-socio-emotional-variables.pdf

Gardner, F. (2000). Methodological issues in the direct observation of parent–child interaction: Do observational findings reflect the natural behavior of participants?. *Clinical child and family psychology review*, *3*(3), 185-198. doi:10.1023/a:1009503409699

Ghiasi, H., Mohammadi, A., & Zarrinfar, P. (2016). An investigation into the roles of theory of mind, emotion regulation, and attachment styles in predicting the traits of borderline personality disorder. *Iranian journal of psychiatry*, *11*(4), 206-213.

Gilli, S. (2016). *Gender Bias in Parenting Styles and its Contribution to Gender Differences* in Empathy. (Unpublished dissertation), University of Cape Town, South Africa.

Gobbini, M. I., & Haxby, J. V. (2007). Neural systems for recognition of familiar faces. *Neuropsychologia*, *45*(1), 32–41. doi:10.1016/j.neuropsychologia.2006.04.015

Gobbini, M. I., Leibenluft, E., Santiago, N., & Haxby, J. V. (2004). Social and emotional attachment in the neural representation of faces. *Neuroimage*, *22*(4), 1628-1635. doi :10.1016/j.neuroimage.2004.03.049

Goldstein, T. R. (2010). The effects of acting training on theory of mind, empathy, and emotion regulation. Unpublished doctoral dissertation, Boston College. http://hdl.handle.net/2345/1970.

Goldstein, T. R., & Winner, E. (2012). Enhancing Empathy and Theory of Mind. *Journal of Cognition and Development*, *13*(1), 19–37. Doi: 10.1080/15248372.2011.573514

Gordon, A. C., & Olson, D. R. (1998). The relation between acquisition of a theory of mind and the capacity to hold in mind. *Journal of experimental child psychology*, *68*(1), 70-83. doi:10.1006/jecp.1997.2423

Goulter, N., Balanji, S., Davis, B. A., James, T., McIntyre, C. L., Smith, E., Thornton, E. M., Craig, S., & Moretti, M. M. (2022). Psychometric evaluation of the affect regulation checklist: Clinical and community samples, parent-reports and youth self-reports. *Journal of Research on Adolescence*, 1-17. doi :10.1111/jora.12779

Grazzani, I., Ornaghi, V., Conte, E., Pepe, A., & Caprin, C. (2018). The relation between emotion understanding and theory of mind in children aged 3 to 8: The key role of language. *Frontiers in psychology*, *9*, 1-10. doi:10.3389/fpsyg.2018.00724

Gross, J. J. (1998). Sharpening the focus: Emotion regulation, arousal, and social

competence. Psychological Inquiry, 9(4), 287-290. doi:10.1207/s15327965pli0904_8

Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological inquiry*, *26*(1), 1-26. doi:10.1080/1047840x.2014.940781

Gross, J. J., & John, O. P. (1998). Mapping the domain of expressivity: multimethod evidence for a hierarchical model. *Journal of personality and social psychology*, *74*(1), 170-191. doi:10.1037/0022-3514.74.1.170

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of personality and social psychology*, *85*(2), 348-362. doi:10.1037/0022-3514.85.2.348

Happé, F. G. (1994). An advanced test of theory of mind: Understanding of story characters' thoughts and feelings by able autistic, mentally handicapped, and normal children and adults. *Journal of autism and Developmental disorders*, *24*(2), 129-154. doi.10.1007/BF02172093

Hasselhorn, M., Mähler, C., & Grube, D. (2005). Theory of mind, working memory, and verbal ability in preschool children: The proposal of a relay race model of the developmental dependencies. In W.Schneider, R. Schumann-Hengsteler & B. Sodian (Eds.), *Young children's cognitive development: Interrelationships among executive functioning, working memory, verbal ability, and theory of mind* (pp. 219-237). Mahwah, NJ: Erlbaum.

Herbers, J. E., Garcia, E. B., & Obradović, J. (2017). Parenting assessed by observation versus parent-report: Moderation by parent distress and family socioeconomic status. *Journal of Child and Family Studies*, *26*(12), 3339–3350. doi:10.1007/s10826-017-0848-8

Hoffman, M. L. (1977). Sex differences in empathy and related behaviors. *Psychological bulletin*, *84*(4), 712–722. doi:10.1037/0033-2909.84.4.712

Hogan, R. (1969). Development of an empathy scale. *Journal of Consulting and Clinical Psychology*, *33*, 307-316. doi:10.1037/h0027580

Hoogenhout, M., & Malcolm-Smith, S. (2014). Theory of mind in autism spectrum disorder: does DSM classification predict development?. *Research in Autism Spectrum Disorders*, *8*(6), 597-607. doi:10.1016/j.rasd.2014.02.005

Hughes, C. (1998). Executive function in preschoolers: Links with theory of mind and verbal

ability. *British journal of developmental psychology, 16*(2), 233-253. doi:10.1111/j.2044-835x.1998.tb00921.x

Hughes, C., Ensor, R., & Marks, A. (2011). Individual differences in false belief understanding are stable from 3 to 6 years of age and predict children's mental state talk with school friends. *Journal of Experimental Child Psychology, 108*(1), 96-112. doi :10.1016/j.jecp.2010.07.012

Ibanez, A., Huepe, D., Gempp, R., Gutiérrez, V., Rivera-Rei, A., & Toledo, M. I. (2013). Empathy, sex and fluid intelligence as predictors of theory of mind. *Personality and individual differences, 54*(5), 616-621. doi:10.1016/j.paid.2012.11.022

IBM Corporation. (2021). IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp

Isaksson, J., Neufeld, J., & Bölte, S. (2021). What's the link between theory of mind and other cognitive abilities–A Co-twin Control Design of Neurodevelopmental Disorders. *Frontiers in psychology, 12*, 1-10. doi:10.3389/fpsyg.2021.575100

Jolliffe, D., & Farrington, D. P. (2006). Development and validation of the Basic Empathy Scale. *Journal of adolescence, 29*(4), 589-611. doi :10.1016/j.adolescence.2005.08.010

Kalbe, E., Grabenhorst, F., Brand, M., Kessler, J., Hilker, R., & Markowitsch, H. J. (2007). Elevated emotional reactivity in affective but not cognitive components of theory of mind: A psychophysiological study. *Journal of Neuropsychology, 1*(1), 27-38. doi:10.1348/174866407x180792

Kalbe, E., Schlegel, M., Sack, A. T., Nowak, D. A., Dafotakis, M., Bangard, C., Brand, M., Shamay-Tsoory, S., Onur, O. A., & Kessler, J. (2010). Dissociating cognitive from affective theory of mind: a TMS study. *Cortex, 46*(6), 769-780. doi:10.1016/j.cortex.2009.07.010

Kanske, P. (2018). The social mind: disentangling affective and cognitive routes to understanding others. *Interdisciplinary Science Reviews, 43*(2), 115-124. doi:10.1080/03080188.2018.1453243

Keenan, T., Olson, D. R., & Marini, Z. (1998). Working memory and children's developing understanding of mind. *Australian Journal of Psychology, 50*(2), 76-82. doi:10.1080/00049539808257537

Ketelaars, M. P., Van Weerdenburg, M., Verhoeven, L., Cuperus, J. M., & Jansonius, K.

(2010). Dynamics of the theory of mind construct: A developmental perspective. *European Journal of Developmental Psychology, 7*(1), 85-103. doi:10.1080/17405620903482081

Kirk, E., Pine, K., Wheatley, L., Howlett, N., Schulz, J., & Fletcher, B. (2015). A longitudinal investigation of the relationship between maternal mind-mindedness and theory of mind. *British journal of developmental psychology, 33*(4), 434-445.

Klein, K. J., & Hodges, S. D. (2001). Gender differences, motivation, and empathic accuracy: When it pays to understand. *Personality and social psychology bulletin, 27*(6), 720-730. doi:10.1177/0146167201276007

Koole, S. L. (2009). The psychology of emotion regulation: An integrative review. *Cognition and emotion, 23*(1), 4-41. 4–41. doi:10.1080/02699930802619031

LaBounty, J., Wellman, H. M., Olson, S., Lagattuta, K., & Liu, D. (2008). Mothers' and fathers' use of internal state talk with their young children. *Social Development, 17*(4), 757-775. doi: 10.1111/j.1467-9507.2007.00450.x

Laghi, F., Lonigro, A., Pallini, S., & Baiocco, R. (2018). Emotion regulation and empathy: Which relation with social conduct?. *The Journal of genetic psychology, 179*(2), 62-70. doi:10.1080/00221325.2018.1424705

Lam, C. B., Solmeyer, A. R., & McHale, S. M. (2012). Sibling relationships and empathy across the transition to adolescence. *Journal of youth and adolescence, 41*(12), 1657-1670. doi:10.1007/s10964-012-9781-8

Laranjo, J., Bernier, A., Meins, E., & Carlson, S. M. (2014). The roles of maternal mind-mindedness and infant security of attachment in predicting preschoolers' understanding of visual perspective taking and false belief. *Journal of experimental child Psychology, 125*, 48-62. doi:10.1016/j.jecp.2014.02.005

Lebowitz, M. S., & Dovidio, J. F. (2015). Implications of emotion regulation strategies for empathic concern, social attitudes, and helping behavior. *Emotion, 15*(2), 187-194. doi:10.1037/a0038820

Lecce, S., & Bianco, F. (2018). Working memory predicts changes in children's theory of mind during middle childhood: A training study. *Cognitive Development, 47*, 71-81. doi:10.1016/j.cogdev.2018.04.002

Lecce, S., Bianco, F., Devine, R. T., & Hughes, C. (2017). Relations between theory of mind

and executive function in middle childhood: A short-term longitudinal study. *Journal of experimental child psychology, 163*, 69-86. doi:10.1016/j.jecp.2017.06.011

Lockwood, P. L., Seara-Cardoso, A., & Viding, E. (2014). Emotion regulation moderates the association between empathy and prosocial behavior. *PloS One, 9*(5), e96555. doi:10.1371/journal.pone.0096555

Louw, M. (2014). *The adaptation of the Griffith Empathy Measure for use in the Western Cape.* (Unpublished honours thesis). University of Cape Town, South Africa.

Lundy, B. L. (2013). Paternal and maternal mind-mindedness and preschoolers' theory of mind: The mediating role of interactional attunement. *Social Development, 22*(1), 58-74. doi:10.1111/sode.12009

Macaskill, A., Maltby, J., & Day, L. (2002). Forgiveness of self and others and emotional empathy. *The Journal of social psychology, 142*(5), 663-665. doi:10.1080/00224540209603925

MacDonald, H. Z., & Price, J. L. (2019). The role of emotion regulation in the relationship between empathy and internalizing symptoms in college students. *Mental Health & Prevention, 13*, 43-49. doi:10.1016/j.mhp.2018.11.004

Malcolm-Smith, S., Woolley, D., & Ward, C. L. (2015). Examining empathy and its association with aggression in young Western Cape children. *Journal of Child & Adolescent Mental Health, 27*(2), 135-147. doi:10.2989/17280583.2015.1085386

McClelland, M. M., & Cameron, C. E. (2012). Self-regulation in early childhood: Improving conceptual clarity and developing ecologically valid measures. *Child development perspectives, 6*(2), 136-142. doi:10.1111/j.1750-8606.2011.00191.x

McMahon, C. A., & Bernier, A. (2017). Twenty years of research on parental mind-mindedness: Empirical findings, theoretical and methodological challenges, and new directions. *Developmental Review, 46*, 54-80. doi:10.1016/j.dr.2017.07.001

Meins, E., Fernyhough, C., Arnott, B., Leekam, S. R., & de Rosnay, M. (2013). Mind-mindedness and theory of mind: Mediating roles of language and perspectival symbolic play. *Child development, 84*(5), 1777-1790. doi:10.1111/cdev.12061

Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind–mindedness and attachment security as predictors of theory of mind understanding. *Child development, 73*(6), 1715-1726. doi:10.1111/1467-8624.00501

Miller, L. E., Perkins, K. A., Dai, Y. G., & Fein, D. A. (2017). Comparison of parent report and direct assessment of child skills in toddlers. *Research in autism spectrum disorders, 41-42*, 57-65. doi:10.1016/j.rasd.2017.08.002

Moretti, M. M. (2003). Affect regulation checklist. Unpublished research measure. Simon Fraser University, Burnaby, British Columbia, Canada.

Moretti, M. M., & Craig, S. G. (2013). Maternal versus paternal physical and emotional abuse, affect regulation and risk for depression from adolescence to early adulthood. *Child abuse & neglect, 37*(1), 4-13. doi:10.1016/j.chiabu.2012.09.015

Moretti, M. M., & Obsuth, I. (2009). Effectiveness of an attachment-focused manualized intervention for parents of teens at risk for aggressive behaviour: The Connect Program. *Journal of Adolescence, 32*(6), 1347-1357. doi:10.1016/j.adolescence.2009.07.013

Morsbach, S. K., & Prinz, R. J. (2006). Understanding and improving the validity of self-report of parenting. *Clinical Child and Family Psychology Review, 9*(1), 1-21. doi:10.1007/s10567-006-0001-5

Murad, A., & Khan, S. (2022). Role of Mother's Education in Developing Children's Empathy. *Academic Journal of Social Sciences (AJSS), 6*(3), 020-037. doi:10.54692/ajss.2022.06031804

Naylor, T. (2015). *Investigating the Presence and Correlates of Callous-Unemotional Traits in Western Cape Children.* (Unpublished dissertation), University of Cape Town, South Africa.

Nelson, K. (2005). Language pathways into the community of minds. In J. W. Astington, & J. A. Baird (Eds.). *Why language matters for theory of mind*. (pp. 26–49). Oxford University Press

Ogle, J., Bushnell, J. A., & Caputi, P. (2013). Empathy is related to clinical competence in medical care. *Medical education, 47*(8), 824-831. doi:10.1111/medu.12232

Öksüz, Y., & Coşkun, K. (2017). An investigation on the relationship between maternal education level, maternal employment, and emotional intelligence performance of 10 years old children. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 18*(3), 456-470. doi:10.29299/kefad.2017.18.3.024

O'Neill, A., D'Souza, A., Samson, A. C., Carballedo, A., Kerskens, C., & Frodl, T. (2015).

Dysregulation between emotion and theory of mind networks in borderline personality disorder. *Psychiatry Research: Neuroimaging*, *231*(1), 25-32. doi:10.1016/j.pscychresns.2014.11.002

Ornaghi, V., Conte, E., & Grazzani, I. (2020). Empathy in Toddlers: The Role of Emotion Regulation, Language Ability, and Maternal Emotion Socialization Style. *Frontiers in Psychology, 11*. doi:10.3389/fpsyg.2020.586862

Ortigue, S., Bianchi-Demicheli, F., Hamilton, A. D. C., & Grafton, S. T. (2007). The neural basis of love as a subliminal prime: an event-related functional magnetic resonance imaging study. *Journal of cognitive neuroscience, 19*(7), 1218-1230. doi: 10.1162/jocn.2007.19.7.1218

Özbaran, B., Kalyoncu, T., & Köse, S. (2018). Theory of mind and emotion regulation difficulties in children with ADHD. *Psychiatry Research, 270,* 117–122. doi:10.1016/j.psychres.2018.09.034

Panfile, T. M., & Laible, D. J. (2012). Attachment security and child's empathy: The mediating role of emotion regulation. *Merrill-Palmer Quarterly, 58*(1) 1-21. doi: 10.2307/23098060

Pears, K. C., & Moses, L. J. (2003). Demographics, parenting, and theory of mind in preschool children. *Social development, 12*(1), 1-20. doi:10.1111/1467-9507.00219

Penney, S. R., & Moretti, M. M. (2010). The roles of affect dysregulation and deficient affect in youth violence. *Criminal Justice and Behavior, 37*(6), 709-731. doi:10.1177/0093854810365446

Pequet, A., & Warnell, K. R. (2021). Thinking of you: Relations between mind-mindedness, theory of mind, and social anxiety traits in middle childhood and adulthood. *Social Development, 30*(1), 95-112. doi: 10.1111/sode.12468

Pileggi, L. A. (2017). *Investigating correlates of aggressive behaviour in South African children and young adolescents living in the Western Cape: the role of empathy* (Doctoral dissertation, University of Cape Town).

Pineda-Alhucema, W., Aristizabal, E., Escudero-Cabarcas, J., Acosta-Lopez, J. E., & Vélez, J. I. (2018). Executive function and theory of mind in children with ADHD: A systematic review. *Neuropsychology review, 28,* 341-358. doi:10.1007/s11065-018-9381-9

Preckel, K., Kanske, P., & Singer, T. (2018). On the interaction of social affect and cognition:

empathy, compassion and theory of mind. *Current Opinion in Behavioral Sciences, 19*, 1-6. doi:10.1016/j.cobeha.2017.07.010

Raine, A., & Chen, F. R. (2018). The cognitive, affective, and somatic empathy scales (CASES) for children. *Journal of Clinical Child & Adolescent Psychology, 47*(1), 24-37. doi:0.1080/15374416.2017.1295383

Reniers, R. L., Corcoran, R., Drake, R., Shryane, N. M., & Völlm, B. A. (2011). The QCAE: A questionnaire of cognitive and affective empathy. *Journal of personality assessment, 93*(1), 84-95. doi:10.1080/00223891.2010.528484

Ringshaw, J. E., Hamilton, K., & Malcolm-Smith, S. (2021). Theory of Mind and Moral Decision-Making in the Context of Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders, 52*(4), 1693-1711. doi:10.1007/s10803-021-05055-z

Roberton, T., Daffern, M., & Bucks, R. S. (2012). Emotion regulation and aggression. *Aggression and Violent Behavior, 17*(1), 72-82. doi:10.1016/j.avb.2011.09.006

Röll, J., Koglin, U., & Petermann, F. (2012). Emotion regulation and childhood aggression: Longitudinal associations. *Child Psychiatry & Human Development*, *43*(6), 909-923. doi:10.1007/s10578-012-0303-4

Rothbart, M. K. (2007). Temperament, development, and personality. *Current directions in psychological science, 16*(4), 207-212. doi :10.1111/j.1467-8721.2007.00505.x

Rothbart, M. K., & Rueda, M. R. (2005). The Development of Effortful Control. In U. Mayr, E. Awh, & S. W. Keele (Eds.), *Developing individuality in the human brain: A tribute to Michael I. Posner* (pp. 167–188). American Psychological Association. doi:10.1037/11108-009

Rowland, J. E., Hamilton, M. K., Vella, N. C., Lino, B. J., Mitchell, P. B., & Green, M. J. (2013). Adaptive associations between social cognition and emotion regulation are absent in schizophrenia and bipolar disorder. *Frontiers in psychology*, *3*, 1-11. doi:10.3389/fpsyg.2012.00607

RStudio Team (2020). RStudio: Integrated Development Environment for R, Version 1.3.1056. Boston, MA. : RStudio, PBC. http://www.rstudio.com/

Sánchez-Pérez, N., Fuentes, L. J., Jolliffe, D., & González-Salinas, C. (2014). Assessing children's empathy through a Spanish adaptation of the Basic Empathy Scale: parent's and child's report forms. *Frontiers in psychology, 5*, 1438. doi:10.3389/fpsyg.2014.01438

Schipper, M., & Petermann, F. (2013). Relating empathy and emotion regulation: Do deficits in empathy trigger emotion dysregulation?. *Social neuroscience*, *8*(1), 101-107. doi:10.1080/17470919.2012.761650

Schwenck, C., Göhle, B., Hauf, J., Warnke, A., Freitag, C. M., & Schneider, W. (2014). Cognitive and emotional empathy in typically developing children: The influence of age, gender, and intelligence. *European Journal of Developmental Psychology, 11*(1), 63-76. doi:10.1080/17405629.2013.808994

Sebastian, C. L., Fontaine, N. M., Bird, G., Blakemore, S. J., De Brito, S. A., McCrory, E. J., & Viding, E. (2012). Neural processing associated with cognitive and affective Theory of Mind in adolescents and adults. *Social cognitive and affective neuroscience*, *7*(1), 53-63. doi:10.1093/scan/nsr023

Shamay-Tsoory, S. G. (2011). The neural bases for empathy. *The Neuroscientist*, *17*(1), 18-24. doi:10.1177/1073858410379268

Sharp, C., Pane, H., Ha, C., Venta, A., Patel, A. B., Sturek, J., & Fonagy, P. (2011). Theory of mind and emotion regulation difficulties in adolescents with borderline traits. *Journal of the American Academy of Child & Adolescent Psychiatry*, *50*(6), 563-573. doi:10.1016/j.jaac.2011.01.017

Shields, A., & Cicchetti, D. (1997). Emotion regulation among school-age children: The development and validation of a new criterion Q-sort scale. *Developmental psychology*, *33*(6), 906-916. doi:10.1037/0012-1649.33.6.906

Shojaeian, N., Li, Z., Kaurav, R. P. S., & Salem, A. A. M. (2022). Theory of Mind Among Swedish Children with ASD, Down Syndrome and Typically Developing Group. *Journal of Autism and Developmental Disorders*, *52*(11), 4774–4782. doi:10.1007/s10803-021-05366-1

Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind reading: review of literature and implications for future research. *Neuroscience & Biobehavioral Reviews*, *30*(6), 855-863. doi:10.1016/j.neubiorev.2006.06.011

Singer, T. (2009). Understanding others: Brain mechanisms of theory of mind and empathy. In P. W. Glimcher, C. F. Camerer, E. Fehr, & R. A. Poldrack (Eds.), *Neuroeconomics: Decision making and the brain* (pp. 251–268). Elsevier Academic Press. doi:10.1016/B978-0-12-374176-9.00017-8

Singer, T., & Klimecki, O. M. (2014). Empathy and compassion. *Current Biology*, *24*(18),

R875-R878. doi:10.1016/j.cub.2014.06.054

Stietz, J., Jauk, E., Krach, S., & Kanske, P. (2019). Dissociating empathy from perspective-taking: evidence from intra-and inter-individual differences research. *Frontiers in psychiatry*, *10*. doi:10.3389/fpsyt.2019.00126

Thompson, N. M., Uusberg, A., Gross, J. J., & Chakrabarti, B. (2019). Empathy and emotion regulation: An integrative account. *Progress in brain research, 247,* 273-304. doi:10.1016/bs.pbr.2019.03.024

Vachon, D. D., Lynam, D. R., & Johnson, J. A. (2014). The (non) relation between empathy and aggression: Surprising results from a meta-analysis. *Psychological Bulletin*, *140*(3), 751-773. doi:10.1037/a0035236

Van Buuren, S. (2021). Multivariate Imputation by Chained Equations. *The Comprehensive R Archive Network*. https://cran.r-project.org/web/packages/mice/mice.pdf

Van der Graaff, J., Branje, S., De Wied, M., Hawk, S., Van Lier, P., & Meeus, W. (2014). Perspective taking and empathic concern in adolescence: Gender differences in developmental changes. *Developmental psychology*, *50*(3), 881-888. doi:10.1037/a0034325

Van Wyhe, K. (2012). *Wechsler Abbreviated Scale of Intelligence: Preliminary normative data for 12-15-year-old English-and Afrikaans-speaking Coloured learners in the Western Cape* (Unpublished masters dissertation), University of Cape Town, South Africa.

Walker, S. (2005). Gender differences in the relationship between young children's peer-related social competence and individual differences in theory of mind. *The Journal of genetic psychology, 166*(3), 297-312. doi:10.3200/gntp.166.3.297-312

Wang, Z., & Wang, L. (2015). The mind and heart of the social child: developing the empathy and theory of mind scale. *Child Development Research,* 1–8. doi:10.1155/2015/171304

Wechsler, D. (1999). *Wechsler abbreviated scale of intelligence manual.* San Antonio, TX: The Psychological Corporation.

Wechsler, D. (2004). *Wechsler Intelligence Scale for Children fourth UK edition manual.* Oxford, UK: Pearson Assessment.

Wellman, H. M. (2011). Developing a Theory of Mind. In U. Goswami (Ed.), *The Wiley-*

Blackwell Handbook of Childhood Cognitive Development, 258-284. Wiley-Blackwell Publishers Ltd

Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child development, 75*(2), 523-541. doi:10.1111/j.1467-8624.2004.00691.x

Wellman, H. M., & Woolley, J. D. (1990). From simple desires to ordinary beliefs: The early development of everyday psychology. *Cognition, 35*(3), 245-275. doi:10.1016/0010-0277(90)90024-e

Westerhof-Evers, H. J., Visser-Keizer, A. C., Fasotti, L., Schönherr, M. C., Vink, M., van der Naalt, J., & Spikman, J. M. (2017). Effectiveness of a Treatment for Impairments in Social Cognition and Emotion Regulation (T-ScEmo) After Traumatic Brain Injury. *Journal of Head Trauma Rehabilitation, 32*(5), 296–307. doi:10.1097/htr.0000000000000332

Westerhof-Evers, H. J., Visser-Keizer, A. C., Fasotti, L., & Spikman, J. M. (2019). Social cognition and emotion regulation: a multifaceted treatment (T-ScEmo) for patients with traumatic brain injury. *Clinical rehabilitation*, *33*(5), 820-833. doi:10.1177/0269215519829803

Wu, Z., & Su, Y. (2014). How do preschoolers' sharing behaviors relate to their theory of mind understanding?. *Journal of Experimental Child Psychology, 120*, 73-86. doi:10.1016/j.jecp.2013.11.007

Zeman, J., Cassano, M., Perry-Parrish, C., & Stegall, S. (2006). Emotion regulation in children and adolescents. Journal of Developmental & Behavioral Pediatrics, 27(2), 155-168. doi:10.1097/00004703-200604000-00014

Appendix

Appendix A: UCT Ethical Approval

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3414 Fax No. (021) 650 4104

5 March 2013

Dr. Susan Malcolm-Smith
Department of Psychology
University of Cape Town
Rondebosch 7701

Dear Dr Malcolm-Smith,

I am pleased to inform you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your project:

The development of moral reasoning

Please use the reference PSY2013-001 if required. I wish you all the best for your study.

Yours sincerely,

Johann Louw PhD
Professor
Chair: Ethics Review Committee

Appendix B: Western Cape Education Department Approval

Directorate: Research

Audrey.wyngaard@westerncape.gov.za
tel: +27 021 467 9272
Fax: 0865902282
Private Bag x9114, Cape Town, 8000
wced.wcape.gov.za

REFERENCE: 20130315-8009
ENQUIRIES: Dr A T Wyngaard

Dr Susan Malcolm-Smith
Department of Psychology
UCT
Rondebosch

Dear Dr Susan Malcolm-Smith

RESEARCH PROPOSAL: THE DEVELOPMENT OF MORAL REASONING

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. Educators' programmes are not to be interrupted.
5. The Study is to be conducted from **15 February 2016 till 30 September 2018**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr A.T Wyngaard at the contact numbers above quoting the reference number?
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as forwarded to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

    The Director: Research Services
    Western Cape Education Department
    Private Bag X9114
    CAPE TOWN
    8000

We wish you success in your research.

Kind regards.
Signed: Dr Audrey T Wyngaard
Directorate: Research
DATE: 11 February 2016

Appendix C: Parental Consent Form

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

The Development of Moral Reasoning

Principal Investigator:
Dr Susan Malcolm-Smith
Senior Lecturer
Department of Psychology
University of Cape Town

Principal Investigator:
Dr Jean Decety
Department of Psychology
University of Chicago

Dear Parent/Legal guardian,

You and your child are invited to participate in a research study investigating the development of moral reasoning in children. This study focuses on how children of different ages feel about good and bad behaviour.

What is involved in this study?

Approximately 360 children aged 3 to 13 years will participate in this study. If your child participates, a researcher will guide her/him through several computer-based tasks. In one task, children will be asked to view pictures of hands or feet in neutral situations (e.g. a hand opening a door) or in situations that could be painful (e.g. a hand getting stuck in a door). In another task, children will view short videos of one person accidentally hurting another person (e.g. a person being bumped) or one person intentionally hurting another person (e.g. a person being pushed). After viewing these pictures and videos, children will be asked how mean the person in the picture is and how good/bad the action was. All pictures are appropriate for children as young as 3 years of age and have been taken from situations children readily observe in every-day life.

Additionally, children will complete a number of pencil and paper tasks. In one such task, your child will answer questions about short stories. These questions will look at their ability to take another person's point of view. Children will also play a game where they have an opportunity to share rewards (stickers or sweets) with others or not, and their interactions with others (such as their friends) will be observed. Altogether this study will take about 90 minutes of your child's time. All sessions will take place either right after school, or during the school day (depending on your and your child's school's preference). We will take a

break after completing some of the tasks, and take additional short breaks if your child gets tired.

We also have a number of questionnaires that will ask you questions about your own views and questions about your child's views. Your completion of these documents is completely voluntary.

Are there any benefits to taking part in the study?

Your child will receive a snack for her/his participation, as well as some stickers of her/his choice, and you will receive R100 if you complete all questionnaires. The results of this research could provide essential information about how children process emotional and moral information and this may be helpful in planning effective educational programs for children with social difficulties.

What are the risks of the study?

There are no risks to you or your child through participating in this research. However, if any child does become at all upset, or tired, she or he may stop participating at any point. We would like to emphasise that participation in this study is entirely voluntary, and will not

affect your child's education. All results will be securely stored, and kept strictly confidential.

If you would like your child to participate in the study, please complete the consent form, as well as the demographics survey, and return to your child's school. Please answer all the questions as accurately and truthfully as possible. We understand that some of this information may be sensitive, but be assured that all information will be kept strictly confidential.

Should you have any questions or queries about the research or your participation, please do not hesitate to contact Lea-Ann Pileggi: (email) leapileggi@gmail.com, or Susan MalcolmSmith: (phone) 021 650 4605, (email) Susan.Malcolm-Smith@uct.ac.za, or contact Professor Johann Louw (Psychology Ethics Committee): (phone) 021 650 3414, (email) Johann.Louw@uct.ac.za.

Thank you for your participation.

CONSENT FORM

The research project and the procedures associated with it have been explained to me. I hereby give my permission for my child to participate in the above-described research project.

Child's name: _____

Parent/guardian's name: _____

Signature of parent/guardian: _____

Date: _____

We will send the questionnaires to you via your child's school once we have received consent. Please provide a contact number below.

If you prefer to complete the questionnaires telephonically, please indicate which time/s would be most convenient to receive this phonecall. Alternatively, please provide an email address if you would prefer the questionnaires be forwarded to you via email.

Phone: _____ Time/s;_____

Email: _____

Appendix D: Child Assent Form

UNIVERSITY OF CAPE TOWN

DEPARTMENT OF PSYCHOLOGY

The Development of Moral Reasoning

Assent Form

Hello! We want to tell you about a research study we are doing. A research study is a way to learn more about something. We would like to find out more about how children feel about good and bad behaviour.

If you agree to join this study, you will be asked to do some tasks on the computer. For example, we will show you some pictures and ask you how you feel about them. We will also show you some short movies on the computer screen. These are not the kind of movies you see on TV. They are movies that we made to help us study how children feel about good and bad behaviour. It is very important that you watch the pictures carefully. You will also be asked to do some other tasks, like tell us the meaning of some words, and we will ask you to answer questions about short stories we will read to you.

Together these tasks will take about 90 minutes. We will take a break after you've done some of the tasks. We can take other short breaks too if you get tired.

You do not have to join this study. It is up to you. No one will be angry with you if you don't want to be in the study or if you join the study and change your mind later and stop.

Do you have any questions about the study? If you think you can do it and you don't have any more questions about it, will you sign this paper? If you sign your name below, it means that you agree to take part in this study.

Child's Signature: _____ Date: _____

Interviewer's Signature: _____ Date: _____

Appendix E: Questionnaire of Cognitive and Affective Empathy

People differ in the way they feel in different situations. Below you are presented with a number of characteristics that ***may or may not apply to your child***. Read each characteristic and indicate how much you agree or disagree with the item by selecting the appropriate box. Answer quickly and honestly.		Strongly agree	Slightly agree	Slightly disagree	Strongly disagree
1.	My child sometimes finds it difficult to see things from another's point of view.				
2.	My child is usually objective when he/she watches a film or play, and doesn't often get completely caught up in it.				
3.	My child tries to look at everybody's side of a disagreement before he/she makes a decision.				
4.	My child sometimes tries to understand his/her friends better by imagining how things look from their perspective.				
5.	When my child is upset at someone, he/she will usually try to "put him/herself in the person's shoes" for a while.				
6.	Before criticizing somebody, my child tries to imagine how he/she would feel in their place.				
7.	My child often gets emotionally involved in his/her friends' problems.				
8.	My child is inclined to get nervous when others around him/her seem nervous.				
9.	People my child is with have a strong influence on his/her mood.				
10.	It affects my child very much when one of his/her friends seems upset.				
11.	My child often gets deeply involved with the feelings of a character in a film, play, or novel.				
12.	My child gets very upset when he/she sees someone cry.				
13.	My child is happy when he/she is with a cheerful group and sad when others are glum.				
14.	It worries my child when others are worrying and panicky.				
15.	My child can easily tell if someone else wants to enter into a conversation.				
16.	My child can quickly pick up if someone says one thing but means another.				
17.	It is hard for my child to see why some things upset people so much.				

18.	My child finds it easy to put him/herself in somebody else's shoes.				
19.	My child is good at predicting how someone will feel.				
20.	My child is quick to spot when someone in a group is feeling awkward or uncomfortable.				
21.	Other people tell my child he/she is good at understanding what others are feeling and what others are thinking.				
22.	My child can easily tell if someone else is interested or bored with what he/she is saying.				
23.	Friends talk to my child about their problems as they say that my child is very understanding.				
24.	My child can sense if he/she is intruding, even if the other person does not tell him/her.				
25.	My child can easily work out what another person might want to talk about.				
26.	My child can tell if someone is masking their true emotion.				
27.	My child is good at predicting what someone will do.				
28.	My child can usually appreciate the other person's viewpoint, even if he/she does not agree with it.				
29.	My child usually stays emotionally detached when watching a film.				
30.	My child always tries to consider the other person's feelings before he/she does something.				
31.	Before my child does something, he/she tries to consider how his/her friends will react to it.				

Appendix F: Affect Regulation Checklist

*Circle the answer that best describes **your child** (circle ONE answer for each question):*

	A LOT like my child	A LITTLE like my child	NOT like my child
1. My child has a hard time controlling his/her feelings.	0	1	2
2. It's very hard for my child to calm down when he/she gets upset.	0	1	2
3. My child's feelings just take over him/her and he/she can't do anything about it.	0	1	2
4. When my child gets upset, it takes a long time for him/her to get over it.	0	1	2
5. Thinking about why he/she has different feelings helps my child learn about him/herself.	0	1	2
6. Thinking about why he/she acts in certain ways helps my child understand him/herself.	0	1	2
7. The time my child spends thinking about what's happened to him/her in her life helps him/her to understand him/herself.	0	1	2
8. If my child thinks about his/her feelings, it just makes everything worse.	0	1	2
9. My child tries hard not to think about his/her feelings.	0	1	2
10. My child prefers to keep feelings in control and not to think about them.	0	1	2
11. My child keeps his/her feelings to him/herself.	0	1	2
12. My child tries to do other things to keep his/her mind off how he/she feels.	0	1	2

Appendix G: Collinearity Statistics

Table 10

Final Model Collinearity Statistics (ToM as the Outcome Variable)[a]

Model		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
5	(Constant)					
	Age	.12	.08	.07	.96	1.04
	IQ Score	.31	.17	.16	.72	1.39
	Digits	.29	.18	.17	.77	1.29
	Gender=Female	.06	.08	.07	.97	1.03
	MaternalHLOE=High School Education	.02	-.03	-.02	.81	1.23
	MaternalHLOE=Primary School Education	-.24	-.15	-.14	.74	1.35
	TotalFamilyIncome=275 001-475 000	.03	.01	.01	.81	1.23
	TotalFamilyIncome=475 001-675 000	.04	.01	.01	.93	1.08
	TotalFamilyIncome=75 001-275 000	.05	-.04	-.03	.79	1.26
	ARC	.06	.07	.06	.93	1.08

a. Dependent Variable: ToM

Table 11

Final Model Collinearity Statistics (QCAE as the Outcome Variable)[a]

Model		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
5	(Constant)					
	Age	-.14	-.15	-.14	.96	1.04
	IQ Score	-.06	-.11	-.11	.72	1.39
	Digits	-.06	-.01	-.01	.77	1.29
	Gender=Female	.01	.01	.01	.97	1.03
	MaternalHLOE=High School Education	.03	-.03	-.03	.81	1.23
	MaternalHLOE=Primary School Education	-.11	-.15	-.15	.74	1.35
	TotalFamilyIncome=275 001-475 000	.11	.12	.11	.81	1.23
	TotalFamilyIncome=475 001-675 000	-.02	.00	.00	.93	1.08
	TotalFamilyIncome=75 001-275 000	-.01	.02	.02	.79	1.26
	ARC	.03	.02	.02	.93	1.08

a. Dependent Variable: QCAE